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ABSTRACT

An educational consultant with experience in teaching graduate courses for teacher certification in gifted education implemented a practicum designed to develop selected thinking skills in approximately 40 nursery school 3-year-olds. The practicum was also intended to inform parents of practical techniques for fostering important thinking skills in their children. Curriculum materials were developed to teach the thinking skills of comparison, classification, ordering, analogy, fluency, flexibility, elaboration, and originality. Techniques which were field-tested with the children were used in the designing of a practical parent handbook for fostering critical thinking skills in the home. The guide focuses on the process of learning to think, the issue of what critical thinking is, the role of the brain in thinking, techniques that foster thinking skills, and recommendations. Practicum evaluation data indicated that standards of performance were met for each of the general goals. Children grew in thinking ability as reported by a group observation log. A critical thinking checklist assessment showed global mean score growth. Parents evaluating the handbook reacted positively. Many related materials, including the critical thinking skills curriculum and the parent guide to preschool children's thinking, are appended. (RH)

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**Center for the
Advancement of Education
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DEVELOPING AND IMPLEMENTING A PARENTAL AWARENESS PROGRAM TO ENHANCE TECHNIQUES FOR FOSTERING PRESCHOOL CRITICAL THINKING SKILLS

BY

HELEN MOORE GILMORE

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NOVA UNIVERSITY

Developing and Implementing a Parental Awareness Program to Enhance Techniques for Fostering Preschool Critical Thinking Skills

by

Helen Moore Gilmore

Cluster XVI

A Practicum II Report
Presented to the Ed. D. Program
in Early Childhood
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA UNIVERSITY

1988

PRACTICUM APPROVAL SHEET

This practicum took place as described.

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Approved:

6/28/88
Date of Final
Approval of Report

E. Riley Holman
E. Riley Holman, Ed.D.

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ABSTRACT

Increasing Parental Awareness of Techniques for Fostering Preschool Critical Thinking Skills. Gilmore, Helen Moore, 1988: Practicum Report, Nova University Ed.D. Program in Early Childhood.
Descriptors: Young children / Preschool children / Early childhood education / Back to basics / Cognitive development / Critical thinking / Intellect / Learning strategies / Parent / Family / Observations / Play

This practicum focused on the problem that parents and preschools were not emphasizing critical thinking skills for their preschool students. A small window of opportunity was being missed to enhance the students' early environment and increase learning potential. The writer's goals were to develop selected thinking skills in approximately 40 nursery school 3-year-olds. Parents of the children were to become knowledgeable of the importance of developing thinking skills in the home.

The writer synthesized ideas from four areas of research to resolve the problem: infant stimulation parenting studies, Piagetian theories, notions from the burgeoning field of critical thinking, and recent brain research. Curriculum was developed to teach the critical/ creative thinking skills of comparison (similarities and differences), classification, ordering (sequencing), analogy, fluency, flexibility, elaboration, and originality. The children received monthly instruction throughout the school year, with playful strategies of song, creative movement, dramatic play, and original musical games. Techniques field tested with the children were used by the writer to design a practical parent handbook for fostering critical thinking skills in the home. Recent brain research was included to increase parental awareness of the urgent need to act.

Standards of performance were met for each of the goals. Children grew in thinking ability as reported by a group observation log; a critical thinking checklist assessment showed global mean score growth. Parents evaluating the handbook gave positive reactions that indicated agreement with the importance of thinking skills and a determination to incorporate them into family nurturing practices.

CHAPTER I

INTRODUCTION

Description of Community

The practicum setting was one of the fastest growing counties in the nation (Herald Staff, 1985) and was located on the southeast coast of Florida. A wide span of socioeconomic groups were represented, from poor farm workers to the very wealthy living along the Atlantic Ocean.

School A, a preschool in the northern sector of the county, whose licensed enrollment capacity was 100 children, was located in an upper-middle class neighborhood whose property abutted a large elementary school. The clientele were mostly children of professional parents. Programs were offered for children 2 to 5 years of age, children of elementary school age for after school care (only from the nearby school), and children 6 through 9 years of age for summer camp. The philosophy of the school was traditional and it was fully licensed by the county.

School B, in the central part of the county, had an enrollment capacity of 60 and was located in a residential and commercial area, which was mostly middle or lower class. The clientele were children of semiprofessionals and parents employed most often in services. Programs were offered for children 2 to 5 years of age. The major philosophy of the school was developmental and the school was fully licensed by the county.

The owner and director of school A was a former teacher in the local school system for many years with a bachelor's degree in early childhood and elementary education. She employed a staff of 15 persons at her preschool, some of whom were part-time help. She used the part-time help to fill in the 6:45 a.m. to 5:30 p.m. working hours. She cleverly capitalized on a flex-time alternative job option for teachers not wishing to work fulltime.

The owner-director of school B was a former kindergarten teacher, of several years, in the local school system and had a master's degree in early childhood education. Seven persons staffed the preschool and the student teacher ratio was 10:1. As with School A, part-time help assisted in the 6:30 a.m. to 6:00 p.m. working hours.

Writer's Role and Responsibilities

The writer, an Ed.D. candidate in Early Childhood at Nova University, earned an M.Ed. degree in curriculum and instruction and a B.A. degree in elementary education, both from Florida Atlantic University. Early teaching experience included 3 years teaching preschool, 4 and 5-year-olds, in a local parochial preschool.

The writer had 20 years' experience in public education in the county. This included 6 years as a general classroom teacher, instructing in grades 1 through 6. Six years were spent as the teacher of kindergarten through third grade gifted students and 8 years as the county's program specialist in gifted education, kindergarten through grade 12. In the last capacity, the writer superivsed more than 100 teachers of gifted students and created various special programs for the 2,700 gifted students in the system. One of those created, a program for minority gifted students, had been replicated in several Florida county school systems.

A recipient of numerous program grants, the writer also designed and taught preschool programs (as an after-work volunteer) for the local science museum, art gallery, and community college music department. One, for the museum, entitled "Rock-a-Bye-Daddy," was for infants and their fathers.

For the past 7 years, the writer had taught the three graduate courses required by the State Department of Education for teacher certification in gifted education. Now an educational consultant, the writer was currently working with parent groups, teachers, preschool programs, private schools, and public school systems. In her capacity as consultant, the writer had participated in numerous educational conferences and had contributed articles for several educational journals.

CHAPTER II

STUDY OF THE PROBLEM

Problem Description

A back-to-basics mentality had crept into the nursery schools and kindergartens and into the minds of eager new parents who were looking for successful cognitive growth in their children. The local school system slavishly followed a unified curriculum that left no room for thinking skills training. Preschools rushed to prepare children for the push for excellence in order to stay competitive but were unaware of or did not care about critical thinking skills.

Parents were swayed by the sometimes intense and misdirected lobbying of a branch of the infant stimulation movement which had pushed for in utero reading (Ludington-Hoe, 1985) and infant flash cards (Doman, 1979). Older parents (the ticking biological clock syndrome) and the Yuppie generation pushed for excellence without being aware of how to achieve it in the critical thinking realm; some saw it as equating with content learning, desks, etc., even for young children. New information in brain research revealed many new directions for early learning, but most parents were unaware of it.

If the problem were resolved, preschool children would learn, through play, to be grounded in the basic critical thinking skills, some of which were distinguishing similarities and differences (both verbally and in figural patterns), mastering sequencing, classification, and analogy skills, and practicing creative problem-solving. Parents would be aware of the importance of time for critical thinking skills and would practice strategies at home and influence their preschools to do likewise.

Briefly stated then, the problem was that parents and preschools were not emphasizing critical thinking skills for preschool children.

Problem Documentation

A review of the literature revealed many instances where the back-to-basics movement had overshadowed a legitimate move toward providing opportunities for critical thinking skills and had changed the goals of education. Several authorities had written against these current practices of pushing content learning and memorization down to the preschool level. Boyer (1987) related that governors' commissions, legislatures, and even the corporate world had had a hand in redirecting goals of education toward more basic instruction.

Gallagher (1985) cited one report, "A Nation at

Risk," as calling for a committment to basic educational excellence that would allow the United States to compete better in a hostile world. With consternation, Gallagher noted that the militant stress on basic excellence (with no frills like critical thinking skills allowed) went so far as to say, "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that existed today, we might well have viewed it a an act of war" (p. 74). According to this report, achievements made in the wake of Sputnik had been squandered. The push was on toward back to basics.

According to Labinowicz (1980), people concerned with preserving their culture, intact, with only basic school instruction given, had clashed with followers of Piaget who felt that the fourth "R" should have been reasoning. Keliher (1986), in relating a personal chronology of opposition to the back-to-basics movement, questioned what might have happened if anxious parents, legislators, and others had wanted to go back to basics in medicine or public health. Keliher noted that such people felt that richness of experience (which usually preceded the development of thinking skills) was available for young children, but that they felt there was no time left over for it from the three R's. Keliher rebutted those persons with the statement, "The three Rs are best learned and remembered through rich, meaningful experiences" (p. 42).

Perkins (1987) warned that the shortcomings of the conservative movement's wish to return to the "good old days" showed that "the three Rs are not enough: thinking is basic, too, so basic that without it the others are learned only in a rote way" (p. 1). Bringing this further down to the very young, Elkind (1987) abhorred the misinterpretation and poor practices taking place in the infant stimulation movement and called it superbaby syndrome. Young children learned from actively exploring real objects, talking to people, and solving real problems, not from having flashcards thrust upon them by misinformed parents.

Octogenarian Mortimer Adler ("Thinking Skills," 1987) felt that thinking skills instruction, which he labeled the latest educational fad, would never work. He faulted the means for achieving these skills and not the teaching of them. He felt that there was no such thing as thinking, itself, that it must be intertwined with a subject or process. Teachers who knew how to think were the key, according to Adler. Without this ingredient, he thought that education was nothing but indoctrination.

Gallup and Clark (1987) conducted a poll which showed that the general public still expected a great emphasis on educational basics. In fact, three-fourths of those polled felt that if basic courses had been increased in schools, it would have improved the quality of schools.

Several authorities spoke out regarding the necessity of including the teaching of thinking skills in programs for young children. Although it was difficult to find references strictly aimed at preschools, generalizations could be made. In fact, results of another Gallup poll of parents (Rosenzveig, 1987) who had been questioned as to what they wanted their children to gain from education showed that the most usual comment was, "to learn how to think" (p. 5).

Sava (1987) felt that a preschool should have its own unique curriculum, however, and not be a watered down version of third grade with all of the trappings of formal schooling. He felt that play, which was learning for children, could whet the young child's appetite for problem-solving thinking tasks. The misguided implementation of infant stimulation theories as well as understandings of how the brain fit into the development of learning and thinking strategies, were also well covered in the literature.

Languis, Sanders and Tipps (1980) felt that parents needed to become aware of what brain research was relating about the preschool learning of many complex cognitive tasks. A process called generative learning was involved which relied on modeling; the brain works at such high speeds that neurologists are finding that children grasp many clues of body language, and use them, as well, in thinking and reasoning.

Browne (1987), in interviews with innovative school administrators, related that the most important thing the Class of 2000 (current kindergartners) would learn was how to think. In fact, the traditional three Rs had been replaced with the three Cs: communication, critical thinking, and coping. Although there was a dearth of thinking skills in schools, Brown (1987) mentioned several visionary states (Connecticut, California, Pennsylvania, and Michigan) which had embarked on efforts to create assessment of critical thinking and higher-order thinking skills in their curriculum.

White (1987) pioneered bringing pilot programs to Missouri which entered the home and trained parents of infants as to what to expect in the development of intelligence, language and social skills. Through well thought out curriculum, it was found that parents could guide their children to high levels of intelligence and language ability by the first 3 years. As outstanding test results flowed in, the whole idea of optimizing early learning took hold in Missouri. The legislature passed a bill that every school district in the state had to provide similar programming statewide for all families with children below 3 years of age. This was the first law of its kind in the world. As usual, the legislature had not not supplied adequate funding to implement the law and White pulled out of the project. He indicated that skimping on funds would affect the quality of the program.

Karnes (1983) stressed the development of creative thinking and problem-solving processes for young preschoolers. This would be taught through exposure to varied experiences and materials, opportunities to elaborate on regular preschool instruction, and exploration of new concepts and ideas through playful methods.

Causitive Analysis

The back-to-basics movement changed the goals of education. An emphasis on academics, subject-area content, and only teaching the basics, even to preschoolers, had stolen time from critical thinking skills instruction. Accordng to Browne (1987), many schools were worried about bringing up test scores and they felt that "basic education" (no frills) would do it.

Parents had not been informed of the importance of teaching critical thinking skills to preschool children and had never been shown practical ways to teach their child to think. In some instances, parents had misconstrued the precepts of the beneficial infant stimulation movement and were pushing their infants to succeed at too quick a rate. Instead of picking up on the cues of the baby, some parents, listening to Doman (1979), were trying to teach reading with flash cards to newborns.

The Yuppie generation was having fewer children and the pressure seemed to be on for those few they did have to excel at everything. More academics were expected earlier. Continuing with the new generation theme, life in the fast lane was now catching up to the preschool. Browne (1987) noted that this was a hurry-up, complex world and preschool children were getting hurried along with it--hurried right out of crucial thinking skills instruction.

Perkins (1987) felt that thinking skills were not emphasized because the passive learning of regular classrooms (where basics were being taught) was much easier to teach. There was much more interaction when thinking was going on. Whimbey and Lochhead (1986) saw thinking skills as hidden skills. Elaborate steps were taken to teach children to think aloud so that they could examine each other's thinking and problem-solving methods. It was so much easier to design curriculum and teach in the old "tried and true" ways.

Relationship of the Problem to the Literature

Ryder (1986), in an historical study of philosophy, thinking skills, critical thinking, and reasoning for children, cited a method using philosophy for young children. The study concluded that there was a need for a shift from content mastery to the mastery of thinking skills, that they were the most basic of all skills. After relating numerous ways neurological development affected the behavior of toddlers (cognitive, motor, speech, etc.), including time-activated patterns, Languis, Sanders, and Tipps (1980) advised that there would be less emotional response to the demands of toddlers if parents knew more about brain development.

Research showed that others had had problems vaguely related to this one and had varying solutions and results. A study by Pellegrini (1982) that related to the problem in this practicum, described early infant intervention with youngsters and parents. Optimal cognitive growth was demonstrated and several colleges were cited for their exemplary programs; the first 3 years of life were found to be the best time to positively influence thinking skills and cognitive growth.

Coplon, and Worth (1985) found that growth in thinking skills followed when parents used preschool books to foster parent-child communication. Insights were developed along with many affective benefits. According to Callanan (1985), as the child acquired language, parent practices could cause better integration of the categories and heirarchies of language and influence thinking. Giving the larger classification of an object to be named, before labeling the actual object itself, helped the child file away language for easier retrieval as thinking skills progressed.

Kamii (1985), in describing Piaget's theories about how young children learn to think and reason, explained:

> Developmentalists are convinced that within each young child a process of unfolding occurs to regulate learning in ways that make worksheets and the 'force-feeding' of isolated skills inappropriate. Still, worksheets are enormously popular in early education. . . . Piagetian research demonstrates a constructivist principle according to which each child builds his or her own knowledge from the inside, through mental activity and in interaction with the environment. (p.1)

Schickedanz, Schickedanz and Forsyth (1982) further explained that Piaget felt two processes were responsible for the growth of knowledge in children. In the first, assimilation, the child took in information about the environment and assimilated it with what was already known. The second process, accommodation, caused mental structures to change to accommodate new information. Equilibration was the term Piaget used to describe the balancing act that went on between the two processes. Moderately novel events planned for children caused them to accommodate new information better; they were intrinsically motivated. Playful learning worked best.

According to Schickedanz, Schickedanz, and Forsyth, stages of development were rather rigidly construed by Piaget. The sensorimotor stage included birth through 2 1/2 years. The preschool years, beginning with the late toddler age, produced many changes and were considered the preoperational stage. Thinking was not yet logical; egocentrisism, centering and irreversibility dominated. A term called "conservation" was a complex theory which described how the child understood number concepts; the way the child viewed space was also a preoperational component.

Early childhood experts were no longer totally enamoured of Piaget's views, however. Chance and Fischman (1987) questioned the stages as being too abrupt a move from one ability to another; they felt most important changes happened gradually, taking months or years to accomplish. Conservation skills happened very early in some children and later in others with no explanation for the difference. Even more devastating to Piaget's hold on understandings of childhood learning for the last 20 years was the fact that psychologists were now looking toward a more complex idea of growth and were studying memory, creativity, problem solving, and social interaction as separate domains. Fascinating studies were revealing that there were flexible schedules for each of these areas of growth; and interestingly, not only age, but the quality of the child's environment, impacted upon the schedule.

Chuska (1986) related that there were many processes, or ways, by which children thought. Several listed (the ones useful for this practicum) were comparing (similarities and differences), classifying, sequencing, using analogies, and creating. For preschoolers, the first one mentioned, comparative thinking, was usually known as detecting similarities and differences and those discrepencies could be verbal (sounds) as well as figural (pictures). They applied to preschoolers as they were helped to distinguish differences in sounds, e.g., using tape recorded sounds of familiar objects, then placing those objects before the child and having him/her match sound with concrete object (Staff, 1987).

Mention was already made of how parents could help preschoolers with classification thinking skills as they were acquiring language. Black and Black (1984) told of figural and verbal classification skills and advised that parents should let children arrange items on shelves for storage, sort collections and schedule activities for the family. They noted that sequencing thinking skills could also be verbal and figural and could involve visual tracking, paper folding (simple level), and experiences with changing size, shape, and color of figures in a sequence.

Verbal analogies could be used with young children if they were asked to tell how they would complete the statement that fingers go with hands; toes go with what? Whimbey and Lochhead (1986) felt that analogies helped to explain ideas to other people and could lead to interesting discoveries. They related that Alexander Graham Bell, stumped by a thinking block on his design of the telelphone, discovered how to complete his invention by analagously studying the human ear, a real one.

Last, but not least, creative problem-solving is an extremely useful thinking skill. Karnes (1986) advised to help preschoolers think and act flexibly, fluently, originally, and with elaboration. Perkins (1987) felt children of all ages should be trained to look at items around them in terms of parts, materials, and shapes. Creativity could move on from there.

Hensel (1977) told how young children's building blocks could assist in critical and creative thinking. She felt that blocks had a definite place in the home and the preschool and noted that they were often overlooked in the push for academic activities. Actually, they lay the foundation for much later academic study. In addition, blocks should be afforded the same respect as art work. They helped fuse creative development with intellectual, emotional and social growth. de Bono (1986) felt that the skilled thinker (young or otherwise) had tools for thinking and then knew which tool to use and how to use it. Lateral thinking, elaborated upon by de Bono, helped restructure ideas so that insights could develop.

In the literature search various disciplines were touched upon including education, psychology, cognitive development, and pediatrics. Among others were family medicine, family counseling, sociology, neurology, neuro-biology, and parenting education.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals

There were two general goals for this practicum:

1. to develop selected thinking skills in preschool children.
2. to inform parents of practical techniques for fostering important thinking skills in their children.

Behavior Expected

The following behaviors were expected upon completion of this practicum:

1. Each child will increase in the ability to use selected thinking skills.
2. Parents of children participating in the program will become knowledgeable of important thinking skills for their children.

Standard of Performance

The following standards of performance were used to measure behavioral objectives:

1. All of the children observed will increase in ability to use thinking skills.
2. Twenty of forty parents will return an evaluation form and react positively to items

contained in it.

Assessment Instruments

The following assessment instruments were used to measure the standards of performance:

1.a. A checklist will assess competencies in the following thinking skills in the small group randomly chosen: distinguishing similarities and differences (figural as well as verbal), classifying, sequencing, recognizing analogies and solving problems creatively.

b. Three randomly chosen children from each small group receiving thinking skills instruction will be used as a sample for this practicum. This procedure is used due to the age of the children and the time needed to make an assessment of the objectives.

c. An observation log will be kept each time the total group meets to work on thinking skills to record improvements in the total group.

2. An evaluation form (see Appendix A) will assess a parental booklet advising parents of important thinking skills for young children.

Unexpected events occurring during the implementation phase of the practicum were recorded in a log. Surprises, deviations and problems were included in this log.

Plans for Analyzing Results

Practicum results were analyzed and included as follows:

1.a. A bar graph will analyze results of the thinking skills checklist assessment.

b. A summary of the thinking skills group observation log will be included in the appendix as well as in the narrative of the final report.

2. A bar graph will portray the results of the parent evaluation form.

Table 1 illustrates how the behavioral expectations, standards of performance, assessment instruments and plans for analyzing results interact with one another.

Table 1

Comparisons of Outcomes and Evaluation Instruments

Behavioral Expectations	Standards of Performance	Assessment Instruments	Analysis Plans
Each child will increase in ability to use selected thinking skills	All children observed will increase in ability to use thinking skills	Observation log will be kept each time total group meets to record improvement in thinking skills	A summary of the observation log will appear in the appendix and in narrative of final product
	Three randomly chosen children from each of five small groups receiving pre and post thinking skills assessment, will increase in ability to use thinking skills	A checklist will assess the following thinking skills: Similarities & differences Classification Analogies Sequencing Creativity (elaboration and originality)	Bar graph
Parents of children participating in program will become knowledgeable of importance of developing thinking skills in children	20 of 40 parents will return an evaluation form and react positively to items contained in it	An evaluation form will assess parental handbook advising of importance of thinking skills for preschool children	Bar graph

CHAPTER IV

SOLUTION STRATEGY

Discussion and Evaluation of Possible Solutions

A search of the literature revealed many varied strategies for parents to use to increase overall growth or generalized areas of growth (cognitive) in their children. Information on increasing generic parenting skills was also plentiful. However, there was a paucity of information on specific instruction in critical thinking skills for preschoolers, as categorized by the writer, and on practical nurturance strategies for parents which were simply written in layman's terms.

Ryder (1986) gave a historical study of philosophy, thinking skills, critical thinking and reasoning for children, but offered nothing for preschoolers. The curriculum mentioned served elementary school-aged children and yielded no solutions that would have impacted upon the problem the practicum presented, for parents or preschool youngsters. Coplon and Worth (1985) spoke of increasing cognitive growth for children through techniques used with preschool books. While this idea provided an excellent tool for increasing parent-child communication, it was not broad enough for the writer's purposes. Ideas from this research might be synthesized for parents, but expansion of techniques was called for in the practicum. Black (1984) provided thinking skills curriculum which appeared to excellently ground the student, but it began at grade 2, and was much too difficult for preschool children.

Callanan (1985) offered good ideas for parents of children developing language as the emphasis was on labeling techniques that fostered easier categorization of information for simpler retrieval during the child's thinking. However this limited technique was also too narrow for the wide array of options needed for the parents' choice in the practicum. It could, however, be coupled with other ideas and utilized as a partial solution for the problem.

Williams (1987) reported that the Patterson, New Jersey Board of Education had incorporated thinking skills into its kindergarten through third-grade classes and had seen steadily climbing statistically significant results. They were communicating closely with parents but did not begin any instruction earlier than kindergarten. Their program had been written for innercity students with achievement difficulties in an urban school population that was 90% minority students. Therefore, its total program was not suitable for the practicum.

Radomski (1983) had a promising parental competence model, but the few suggestions on fostering cognitive growth did not touch on specific thinking skills instruction. Brewer (1980) in her dissertation delved into sources of logico-mathematical knowledge; this lone area did not meet the writer's goals to increase parents' awareness of a broad array of thinking skills, including creative problem solving.

Caruso's (1985) dissertation included creativity and revealed that the child's exploratory behavior at 1 year of age was related to later creative problem solving at age 2. Some ideas from this study were useful, but it was difficult to have a significant group to work with of the age in the preschool setting available to the writer.

Pellegrini (1982) discussed children's programs undertaken during the sensitive ages of birth to 3 years by the Massachusetts Early Education Project, the Brookline Early Education Project, the Florida Parent Education Program and the University of Wisconsin. Results had been impressive: in Wisconsin, alone, there had been an average IQ gain of 33 points. However, all instruction had occured in the home. The most significant results had come about when intervention had been started with infants, when the mother had received instruction in the techniques (at home) which she later had practiced, and when the activities had been long term. The writer did not have access to a large number of infants whose parents would have been willing to participate; transportation to many homes would have been prohibitive in the large county, and the writer felt the toddler age would be a more practical place to start.

Labinowicz (1980) and Forman and Kuschner (1983) reported that there was no doubt that Piaget (1969) was king in the field of cognitive development. Many had tried to simplify and explain his ideas of assimilation, accomodation, equilibration, conservation, and the child's construction of knowledge. Boiling the ideas down further for the comsumption of the lay parent would take great skill. However, the writer, in the quest to solve the practicum's problem and bring to fruition the goals and objectives, wanted to use the ideas of Perkins (1986), Black (1984), Whimbey and Lochhead (1986), Sternberg (1985), and de Bono (1986) which put a little different spin on the critical thinking movement. None of these authors, though, purported to speak for the very young child and their work, at the least, began with elementary-aged children and did not even attempt to explain teaching strategies in layman parents' terms.

Languis, Sanders and Tipps (1980) cited an excellent resource from the National Association for the Education of Young Children which reported on interesting research emerging from the neurosciences and related disciplines. It put into perspective possible future directions for early childhood education due to the new information. The many fascinating ways in which the brain assisted or blocked learning were being revealed and had great significance for the writer as thinking skills curriculum was being designed and implemented.

Description and Justification of Solution Selected

Since there was a paucity of information available on specific thinking skills instruction, especially at the preschool level and since the research revealed no simply written information aiding the lay parent's understanding of the importance of these skills, it was the intent of the writer to synthesize the four areas of research cited above to create an original solution which would more closely address the goals and objectives of the practicum. Those areas include the parenting studies, the Piagetian theories, the fresh ideas of the new critical thinking skills pundits, and the unique light that the latest brain research shed upon the practicum topic. The writer felt that the following ideas might also have been solutions:

1. Develop and teach several months of thinking skills activities to preschoolers in two local preschools. One problem with this was that the critical thinking skills developed and taught might have proven to be too difficult for this age child. That might have been why the research was so sparse. Since the instruction might never be carried on by the parents or teachers, any gains in thinking skills might disappear quickly.

2. Train teachers to do thinking skills activities with students. Teachers might have been reluctant to have been involved in this activity. The results of the practicum would have impacted on very few people in a small preschool setting.

3. Give a seminar for parents on the importance of thinking skills for preschool children. The Community College, a natural location for such a seminar might not

have been interested. This would have been a temporary, one-shot solution to an ongoing problem.

4. Make a videotape for parents demonstrating a playful session with thinking skills and young children. This solution would not have been cost effective with all of the expensive editing equipment needed. Further, the writer would have needed the help of a technician.

5. Design a videotape for teachers outlining the steps for developing thinking skills in preschool children. Teachers might ignore this solution and return to familiar lesson plans. The writer might have been unable to execute this solution alone and it would have been too costly.

6. Write a pamphlet for parents describing practical ways to teach critical thinking skills, playfully, in the home. The parents could have ignored the solution; they might have thought that the activities were too time-consuming for their busy schedules.

The solution chosen by the writer would include teaching critical thinking skills to 30 to 40 3-year-olds in two preschools and developing a handbook for parents emphasizing practical critical thinking skills activities to be used in the home. The curriculum for the sessions would be written with ideas gleaned from the research. The parent pamphlet would be approximatley 20 to 30 pages, illustrated by the students and the writer (using a camera), and would meet criteria set by the writer (see Appendix B).

Justification for the solution selected included the fact that it was cost effective, student input would make the ideas fresher and allow for modifications where needed, and photographs and student drawings could be obtained easily (with parental permission) for inclusion in the pamphlet. The solution also included sessions with students to assist in field-testing materials for the pamphlet. There was greater visibility for this solution, compared to others, as it could be widely disseminated. In addition, the writer could execute the solution alone.

Other factors impacting on the chosen solution included the feeling that it was creative; as far as the writer knew, it had not been tried before. It would help parents put the back-to-basics movement in a proper perspective. Hopefully, it would temper parent concern for early education with built-in decompression suggestions for the overly intense parent, with tendencies to push the child. Parents would understand the critical need for the activities and the small window of opportunity available for such important activities, due to a better understanding of the latest brain research. A vital reason for the selection of this solution: it zeroed in on the goals and objectives of the practicum, developing thinking skills in preschool children and informing parents of practical techniques for fostering these skills in the home.

Report of Action Taken

Early development of the criteria checklist for the parent handbook (see Appendix B) and the parent handbook evaluation form (see Appendix A) gave specific focus to implementing this practicum. Continuous research assisted with ideas needed for the handbook and for the design of the critical thinking skills curriculum (see Appendix C). In order to have enough quantitative data to analyze the critical thinking skills checklist assessment with a bar graph, the assessment created (see Appendix D) had to have only measureable behavioral items.

This was most difficult since the assessment had to be brief in order to enable the writer to administer it quickly, and individually, to the small group of randomly selected, fidgety students that made up the sample. Due to this difficulty encountered (the small amount of time to administer the assessment), the writer deviated from the plan and reduced the creativity items to be assessed by two. All creativity skills were still taught in the play sessions. Originality and flexibility were removed, but fluency and elaboration remained in the checklist assessment. All of the critical thinking skill items remained intact. In addition, an ancillary list (see Appendix E) had to be included showing the frequency of additional terms used by the children in the verbal similarity assessment item.

All along, material was being gathered for teaching the curriculum. The writer also located two preschools willing to cooperate with the practicum and schedules were set with the two owners. Letters requesting parent permission for the children to participate were drafted and, due to the fine cooperation received, the letters went out over the signatures of the two owners. Care was taken, in the letter, to alert the parents to the brief evaluation form (see Appendix A) that would accompany their complimentary copy of the critical thinking skills handbook at the end of the instruction. Thus, parents were asked by the owner, way in advance, to voluntarily complete the handbook evaluation in order to assist the writer.

Approximately 40 children, most 3 years of age or a little younger, participated. The larger preschool had to divide its children into three small groups to make the play sessions more manageable. The smaller school divided its 3-year-olds into two groups. Using the roster of student names, the writer randomly selected three children from each of the five groups to be used as a sample for the pre and posttest critical thinking skills checklist assessment. Alternates were also chosen in case sample children became ill or were withdrawn from the preschool. After the assessment was given to the small sample group, the monthly curriculum sessions began.

Although an effort was made to emphasize at least two areas of the critical thinking skills and one from the creative thinking skills pool monthly, almost all skills were touched upon at each session. Fun games and critical thinking songs were reviewed at the beginning of most sessions; there was much reinforcement of past concepts. It became almost a ritualistic game to open with an action poem on thinking: the children expected it. As much time as possible was devoted to free, open play on the rug or options similar to critical thinking skills at the tables and on the rug where children could choose which thinking game or thinking activity they desired for the morning.

A theme was usually used for each session. Activities, original songs, poems, and games scheduled for the parent handbook were field tested with the small groups of children. A separate log was kept for the parent handbook to record how these ideas were accepted or rejected. Some activities got a lukewarm reception; others became constant requests. A student observation log was also kept to note special learning situations and to record progress and improvement in thinking in the total group of children.

Each 75-minute session ended with some type of expressive art activity, either with crayons, markers, play-doh, or the "Choose and Do" box from which they fashioned a design or an invention. The actual teaching ran for 7 months, from October to April.

At the end of the sessions, the critical thinking skills checklist assessment posttest (see Appendix D) was administered to the small sample group. All along, the parent handbook was being developed. The writer deviated from the plan to illustrate the handbook with children's drawings or the writer's photographs. There were very few children's drawings that would have been appropriate and the writer was so preoccupied with tasks of keeping up with all of those 3-year-olds, there was no time to devote to photography. Other illustrations were substituted for those in the original plan.

The plan had also been to develop a 20 to 30 page pamphlet. A 46-page parent handbook emerged (see Appendix F), as the writer had difficulty paring it down more. Due to its size, the cost of printing was naturally higher than projected. Another roadblock encountered was the inability of the printer to have the handbook available at the time promised. This caused great delay in dissemination as the period of projected distribution, just before a long holiday weekend, was missed. Many days elapsed between its delivery to the printer and its actual dissemination.

The handbook was finally disseminated to the parents with the brief parent handbook evaluation form (see Appendix A). One minor problem arose when parents and teachers, other than those involved, began asking the preschools for copies. The writer distributed a few but then had to refuse as the supply was short. The preschools cooperated by collecting the parent evaluation forms.

CHAPTER V

RESULTS, CONCLUSIONS AND RECOMMENDATIONS

Results

Results of this preschool critical thinking skills practicum showed that the objectives were clearly met throughout the process and that the parents involved did become more aware of critical thinking skills and their importance for preschool children. Parents responded favorably to the parent handbook that emerged from the practicum (see Appendix F). Strategies in the pamphlet were field tested with preschool children prior to dissemination of the booklet. A group observation log (see Appendix G) and a critical thinking checklist assessment showed growth in thinking ability among the children. One parent commented in her handbook evaluation form, "I am pleasantly surprised to note a change in my child's thinking prowess."

The first objective of the practicum was that each child would increase in ability to use selected thinking skills. The writer took copious notes and placed them in a group observation log which is summarized in Appendix G. This log helped give an overall picture of the improvement and success of the total student group in the thinking skills play. As the year progressed, distinct changes in thinking were noted. When choices were given as to center activities, new children would appear at the Thinking Skills center to play with the attribute blocks and other thinking development equipment.

Frequency and quality of answers gradually improved with the thinking ability game-songs the writer created for the practicum. A playful approach was taken with these games as children attempted to name opposites or similarities in objects and sequences involved in problem solving. The observations noted that even in analogies, more answers were forthcoming and the children were learning giant thinking concepts painlessly. A myriad of activities were carried out and the log reflected that the children "stayed" with the fun-type learning strategies.

Three children, randomly chosen from each of the five small groups that met with the writer monthly, also were given a pre and postthinking checklist assessment (see Appendix D). The sampling procedure was chosen due to the age of the children and the time needed to measure the objectives. Working slowly and unhurriedly with children of this age was a must. Maximum time was needed and with a total of 40 children involved; assessing each one would have been prohibitive due to the excessive amount of time needed.

The critical thinking skills checklist assessment was used both before the initial play with thinking skills and after the final completion of the nursery thinking play sessions. The competency checklist was designed to touch on several general areas in the thinking skills pool.

In the area of comparitive thinking, ability in similar and differential thinking was observed. Chances to classify, play with analogies, and sequence objects were included. Creative thinking experiences with fluency and elaboration rounded out the checklist assessment. Simple tasks were designed; the checklist was not meant to be used as a major tool of assessment in the field, but was constructed partly to provide final quantitative data with which to create the summary graph. A global mean score was obtained for both critical and creative thinking pre and posttests. Change resulting from the critical thinking skill instruction was measured and demonstrated growth (see Appendix H).

Global mean scores for the critical thinking portion (as opposed to the creativity portion) showed 14 points positive difference. Global mean scores for creative thinking skills also increased by 7.91 points, giving a nod of approval to the critical thinking skills instructional package the students had received from the writer over the school year.

Individual subsection scores on the thinking skills checklist assessment were placed into a table of all possible means scores (see Table 2). This provided a greater opportunity to contrast results of the checklist assessment. Higher positive differences in mean scores were noted in the areas of fluency, elaboration, and verbal similarity (comparitive thinking). Areas still showing growth, but weaker in positive number, were figural and verbal differences (comparitive thinking), analogy, and ordering (sequencing) information.

In the verbal similarity section, an exhaustive list of all possible answers presumed to be given by a 3-year-old were written into the assessment. Any reasonable new answers given by children were considered valid and were figured into the score. An ancillary list of the additional words supplied by students, in a frequency breakdown, illustrates this procedure and results (see Appendix E).

For the second objective, parents of children participating in the program were expected to become knowledgeable of the importance of developing thinking skills in their children. A preschool parent handbook was the mechanism to disseminate this knowledge. As a standard of performance, 20 of the 40 parents receiving the booklet were expected to return a handbook evaluation form and react positively to the ideas contained in it.

Table 2

Data Table of All Possible Mean Scores for Critical Thinking Skills Assessment

DATA TABLE of ALL POSSIBLE MEAN SCORES
CRITICAL THINKING SKILLS ASSESSMENT

PRETEST

Verbal Similarities	Figural Similarities	Similarities Sub-total	Verbal Differences	Figural Differences	Differences Sub-total	Classifying	Sequencing	Analogies
3 20	3.48	6.67	2.67	3.53	6.13	7.93	.93	.53

POSTTEST

Verbal Similarities	Figural Similarities	Similarities Sub-total	Verbal Differences	Figural Differences	Differences Sub-total	Classifying	Sequencing	Analogies
7.53	5.66	13.20	3.93	4.66	8.60	10.00	2.66	2.13

CREATIVE THINKING SKILLS

PRETEST		POSTTEST	
Fluency	Elaboration	Fluency	Elaboration
1.93	3.92	5.66	8.13

The handbook criteria checklist (see Appendix B) was met except for item 3, its cost effectiveness. This was due to its length.

In a yes-no response format, parents were asked whether they had read and agreed with the handbook and if they agreed with the importance of the skills for young children. Their opinion of the usefulness of it for their child was surveyed, as well as to their commitment to do some of the activities in it. They were assessed as to their plans to use the handbook over the next year. A place for comments elicited individual reactions and feelings. It was felt that the feedback would determine if the material caught the parents' interest long enough for them to look at the handbook and see if they read or approved of its content. Tapping parental motivation was felt to be an important determinant as to the success of the handbook. Completion and return of the evaluation form would measure the impact the parent handbook had upon parents; it indicated a level of interest busy parents had in the whole idea of fostering thinking in their children.

Twenty-six returned the form (65%), with positive results all around (see Appendix I). Ninety-six percent not only noted that they had read the handbook, but the same number agreed with the importance of the skills for children. The same high percentage felt the book would be useful for their child and checked that they planned to do some of the thinking skill activities. Although results were quick to be returned to the writer, 70% said that they had already done a few of the activities with their youngsters. Those planning to conintue doing the activities over the next year numbered 94%.

Comments gleaned from the parents included:

> What a wonderful handbook! I've read it cover to cover already and plan to use your suggestions every day!
>
> I've been doing a number of the skills with my son, but had not realized their importance and meaning.
>
> I find the thinking skills in the handbook very interesting; it's a very helpful tool I plan to use to enhance my son's learning.
>
> We realized we were doing these things naturally, thank heavens! (from both mother and father)
>
> Enjoyed reading and plan on applying these skills with all my children.

Conclusions

The writer concludes that thinking can be taught as displayed by the increase in ability of the children in this practicum. It must be done, though, in a playful, easy-going way. Elkind (1987) is correct when he warns not to hurry children. The writer further concludes that Piaget (1969) is still king. His ideas, put into use in this practicum, both with the children and with the parent handbook, have gained him even more respect from the writer. More care needs to be taken to improve the thinking skills of more of our country's young, to develop the potential there.

The writer found that intentions to synthesize four major areas of research in order to create an original solution to this practicum problem, worked. The task was large, that of not only increasing the children's thinking ability, but the parent's knowledge about how it works and can be enhanced. Those vital areas included ideas from new parent studies, such as Pellegrini (1982), Caruso (1985), and White (1987). The Piagetian theories (1969) will forever, it seems, be entwined with anything good for children. The third area includes the fresh new ideas from the critical thinking people--Black (1984), Whimbey and Lochhead (1982), and Perkins (1987). And the most fascinating frontier, the exciting new information about the brain and how it works (Clark, 1988).

Centuries ago, Plato told us that the beginning is the most important part of the work. The writer concludes that now is the time to educate and mobilize parents to take up the standard and see to it that their child has the best, possible beginning. Hopefully, the handbook springing from this practicum may have some small part in that solution.

Recommendations

Recommendations growing out of this practicum include:

to encourage national dissemination of information about the importance of critical thinking skills for maximum cognitive development in young children.

to educate the decision makers of the land to the importance of thinking skill enhancement so they may enact enabling legislation to assist parents of young children in this task (White, 1987).

Dissemination

Since the beginning of this practicum, the writer has disseminated information regarding critical thinking skills for young children to the following groups:

1988 Conference, Gifted Child Institute, Arlington, Texas

1987 Conference, Florida Association for Gifted Children

1987 Conference, Florida Association for Children Under Six

1987 Leadership Conference, Edyth Bush Foundation, Florida

1987 Conference, Parents of Able Learners, Tampa, Florida

1988 Conference, Child Care Resource & Referral, Florida Atlantic University

Plans are underway to do inservice training in preschool critical thinking skills at several private preschools. A publisher of gifted education books has asked permission to publish the parent handbook.

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APPENDIX A

EVALUATION FORM FOR PARENT HANDBOOK
CRITICAL THINKING SKILLS

PLEASE CHECK YES OR NO

YES NO

--- --- I received the critical thinking skills handbook.

--- --- I have read the handbook.

--- --- I agree with the importance of thinking skills for young children.

--- --- I feel the thinking skills activities handbook will be useful for my child.

--- --- I plan to do some of the thinking skills activities with my child.

--- --- I have already done a few of the activities with my child.

--- --- I plan to continue doing the activities over the next year with my child.

COMMENTS: --

Please return by .... to CREATIVE LEARNING EXPERIENCE

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Appendix B

Handbook Criteria Checklist

HANDBOOK CRITERIA CHECKLIST

The Critical Skills Parent Handbook will be designed and evaluated on the following 5-point checklist. It must be:

1. Esthetically pleasing
2. Easy to read; minimum of jargon
3. Cost effective
4. Reliable and credible with facts checked carefully, credited to proper source
5. Referenced enabling reader to gain further information from reference list

Appendix C

Critical Thinking Skills Curriculum

PRESCHOOL CRITICAL THINKING SKILLS CURRICULUM

"RING AROUND THE HEXAGON: A THINKING PRIMER"

PROVIDE OPPORTUNITIES FOR:

THINKING SKILLS TARGET	COMPARING	FLUENCY
	CLASSIFYING	FLEXIBILITY
	ORDERING Info	ELABORATION
	Doing ANALOGIES	ORIGINALITY

MUNCHKIN MOTIVATOR:

Noisily dump a large box of Attribute Blocks (varying shapes, colors, sizes, thicknesses) on the rug. Ask who would like to see if they can find the hiding places for the various attribute blocks shapes. Children will have fun sorting each shape as they are returned to the compartmentalized box. Only correct shapes will fit in a certain classified order. Large, brightly-colored circles of yarn could be placed on floor with one of each shape inside. Tell the children that only the squares may hide in the square yarn hiding place. Shoe boxes with various shapes glued on each box (one box per different shape) could also be used as "shape hiding places."

*THINKUMS (ACTIVITIES):

1. CLASSIFY After the sorting, play "Ring Around the Hexagon," etc. (TUNE: "Ring Around the Rosie") to teach the

various names of shapes. Place shapes, one at a time, in middle of circle on floor. Play the game around it.

2. COMPARE/ORDER/FLEXIBILITY (similar sounds, rhythms, chant) After discussing what children do as they get ready for bed each night, create a "Good Night Rhythm Story" (see sample) using rhythm sounds in sets of four:

Scrub, scrub, scrub, scrub (IN BATH)
Brush, brush, brush, brush (TEETH)
Read, read, read, read (BOOK WITH MOM/DAD)
Night, night, night, night (WAVE GOODNIGHT)

After doing story together several times, do it strictly in pantomime. See if they can get the right sequence. Let them add to it.

3. ELABORATION/ORDER Discuss purpose of critical thinking skills class, eg., to learn more about thinking. Ask several rhetorical questions. What do we use to think? Hand? Foot? As children say head or brain, act out poem:

"Think, Think, Think"

I use by brain to think, think, think (TAP TEMPLE)
I use my mouth to talk (SIMULATE TALKING WITH HAND)
I use my eyes to wink, wink, wink (WINK 3 TIMES)
I use my legs to walk (WALK AROUND ROOM)

I use my throat to yell, yell, yell (PRETEND TO YELL)
I use my face to grin (GRIN BROADLY)
I use my nose to smell, smell, smell (BIG SNIFF)
I use my feet to spin (SPIN AROUND ON ONE FOOT)

Helen Gilmore

4. ORIGINALITY/FLUENCY/ELABORATION Place large pieces construction paper (no smaller than 18 X 24") and washable colored markers on tables. Talk about drawing "Things I Like to Think About." Nothing will probably be recognizable re the title, but it will get the children talking about the subject. No pressure to draw any special thing, please, just whatever they wish to "design." Ask, "Tell me about your drawing," never "What is it?" Chat with children as they are preoccupied with their task. Tell of things the teacher likes to think about. Those finishing their art work early may wish to return to the rug to continue playing with sorting the blocks. Others may wish to elaborate upon their drawing and should be allowed the time.

5. COMPARE/ORDER End with dramatization of the poem, "Five Little Pumpkins" (or other topical poem easily dramatized). Use five, large construction paper pumpkins (made in advance) with slightly different features (some triangle eyes will face up, some down, etc.). Compare several at a time and discuss with children how they are similar and different.

FIVE LITTLE PUMPKINS

Five little pumpkins, sitting on the gate.
The first one said, "My, it's getting late!"
The second one said, "There are witches in the air!"
The third one said, "We don't care."
The fourth one said, "Let's run, let's run!"

The fifth one said, "Isn't Halloween fun?"
Oooooo went the wind, and OUT (CLAP) went the light,
And those five little pumpkins ran fast out of sight.
(PRETEND TO RUN AWAY)

* Throughout this thinking skills curriculum package, it will be noted that there are many more "thinkums" offered than might be accomplished on a given morning. This was done intentionally so that the teacher might have many options from which to choose. The writer has found that, with teaching three-year-olds, it is better to overplan than the other way around.

MATERIALS:

Attribute blocks
Yarn, shoe boxes
Colored paper
Colored markers
5 pumpkins

MUSIC:

"Ring Around the Hexagon"
"Good Night Rhythm Story"

ART:

Draw with marking pens and
large pieces of colored
construction paper

LITERATURE:

Poem - "Think, Think, Think"

DRAMA/GAMES:

"Five Little Pumpkins"

"THANKFUL THINKING"

PROVIDE OPPORTUNITIES FOR:

THINKING SKILLS TARGET	COMPARING	FLUENCY
	CLASSIFYING	FLEXIBILITY
	ORDERING Info	ELABORATION
	Doing ANALOGIES	ORIGINALITY

MUNCHKIN MOTIVATOR:

As children sit on the rug, place a fairly heavy rock, one at a time, in each one's hand, palm up. Talk about how it feels (HEAVY?). Bring out a clear plastic bag filled with colored feathers. Ask each child to choose one. Take the feather out and place it on the child's outstretched palm. Remind of the weight of the rock. Ask how the feather feels. (LIGHT?) Say, "A rock is heavy and a feather is ----?" (WAIT FOR RESPONSE, POSSIBLY "LIGHT"). Discuss other things that are heavy and light.

THINKUMS (ACTIVITIES):

1. ANALOGY After the prior discussion, ease into some play with analogies. Say, "A baby is weak and Superman is ---?" (MAKE A MUSCLE AND WAIT FOR RESPONSE -- STRONG?) " A kitten is little and an elephant is ---?" (BIG). Initially it is best to use the language above for analogical play. Later on the child will begin to understand the terminology, kitten is to little as elephant

is to big. Go slowly and playfully.

2. COMPARE/FLEXIBILITY/ORIGINALITY Ask the children to use their feathers to create a dance. Beat on a tom tom with a good steady beat. Listen for the sameness of the pulse of the music. Dance, Indian style, until children tire of activity.

3. COMPARE Skim through a picture book of Hiawatha. Compare and contrast how he lived in woods and wore feathers and fringe. Take up feathers and save for later art activity.

4. CLASSIFY/FLUENCY/FLEXIBILITY Discuss what the family will eat on Thanksgiving. Talk of going to the store with parents. Name all the things you like to buy at the store. Dramatize a trip to the store with Mom or Dad. Discuss where you find all the milk, cereal, etc. All the bakery goods? "Can you find the bread?" Discuss how food is classified in the store. Pretend to put the canned goods away on the proper shelf at home. Good helpers!

5. ORDER "Many other things are classified. Name your favorite fruit?" Discuss. " How about apples? What's inside?" Show an apple; tell that you are going to cut it in half and ask each child to predict what will be inside. After showing the star shaped seed case inside, bring out a kitchen gadget that cores and cuts apples into eighths. Count the partitions with the children. Cut an apple with it and ask the children to predict how many pieces there will be. Share the apple sections. Act out this poem:

"Five Favorite Fruits"

Five shiny apples sitting in the store,
Teresa bought one, and then there were four.
Four juicy apples, some for you and me,
John ate one, and then there were three.
Three red apples, my favorite, it's true,
Justin ate one, and then there were two.
Two sweet apples, eating them is fun,
I ate the last, and then there were none.

Helen Gilmore

6. ORIGINALITY/FLEXIBILITY/ELABORATION/CLASSIFY Put large pieces of paper, crayons and safety scissors on tables. Return feather that child chose. As children begin to draw, let them know that you will glue their feather to their picture ANYWHERE they want it. Some children will agonize over placement of the feather; some will know immediately where they want it to go. Show children how to fringe the edges of their paper. Those who tire of these activities may play with attribute blocks and Cuisenaire rods on the rug.

7. ORDER End with the "Ten Little Indians" song." Let children try to order each other in a line by height.

MATERIALS:

Rock

Plastic bag of colored feathers

Tom tom

Apples, cutting board

Knife and apple corer kitchen gadget

Napkins

Large paper, crayons, safety scissors, heavy duty glue

Attribute blocks

Cuisenaire Rods

MUSIC:

Indian dance music

"Ten Little Indians"

ART:

"Feather and Fringe" art

LITERATURE:

Picture book of Hiawatha

Poem: "Five, Favorite Fruits"

DRAMA/GAMES:

"Going to the Store"

"OPPOSITES"

PROVIDE OPPORTUNITIES FOR:

THINKING SKILLS TARGET	COMPARING CLASSIFYING ORDERING Info Doing ANALOGIES	FLUENCY FLEXIBILITY ELABORATION ORIGINALITY

Talk to the children through reindeer puppets. Say, "The thing I like best about pulling a sleigh is the bells. Do you want to take a sleigh ride with me?" (Show picture of a sleigh). Provide a large bell (tied with a thick yarn handle) for each child. Using a sleigh ride record, gallop around classroom ringing bells to the pulse of the music.

THINKUMS (ACTIVITIES):

1. FLEXIBILITY/ELABORATION/COMPARE

Talk about reindeer (show puppet or picture). Ask children how many legs a reindeer has. A chicken? A snake? Themselves? Using the music mentioned above or "Rudolph" music, dance around the room again, THIS time pretending to BE reindeer. As the dancing progresses, ask, "How does it feel to have four legs, antlers (put hands to head for mock antlers), hooves instead of toes? How could your dad play 'This Little Piggy Went to Market' with you?" "Can you go slowly like a tired reindeer? Quickly? Can you go backward?"

2. CLASSIFY Play the game, "What's in a Square." (Thinking Works, P.O. Box 468, St. Augustine, FL 32085). This Tel Aviv University board game is excellent for teaching classification. Children love it.

3. FLEXIBILITY/ELABORATION

Play "What If?" with the children by asking many questions such as, "What if you were a happy dinosaur; how would you move? Sad? What if dragon flies gave rides? What would that feel like (pretend to ride)?" End with, "What if toys came to life and could move around?" Show a toy soldier doll. Play a march ("Parade of the Wooden Soldiers" would be best), and march around room, stiff-legged. At the end of the rousing march, pretend to be rag dolls; slump limply and finally fall to floor.

4. COMPARE Sing the "Opposites" song and play the game. After the first few verses, refrain from singing the song, and just ask, "I say hot and you say ---? (COLD)" Children will have great fun with this game, but start out very simply. This is an abstract concept. It is good to use actual objects in the beginning, such as touching the carpet (for ROUGH) and the tabletop for smooth.

5. FLUENCY/FLEXIBILITY/ELABORATION/ORIGINALITY Pretend that you have no money, but want to give your mother a gift. You have found a can of play-doh. "In what ways might you turn the play-doh into a gift for Mom?" As children work at tables, talk quietly about each child's

gift. Some will just play with the doh and that is fine. Draw out each one by asking, "Tell me about your gift." Encourage all responses; children especially creative should be asked to make a gift for Dad, too, and Grandma, and their best friend. Those wanting to keep sorting and playing with attribute blocks may do so.

6. ORDER End with dramatization of the poem, "Think, Think, Think."

MATERIALS:

Reindeer puppets

Sleigh bells

Sleigh bell and march music

Reindeer music

Play-doh

Attribute Blocks

Cuisenaire Rods

MUSIC:

"Sleigh Ride"

"Parade of Wooden Soldier"

"Rudolph" music

ART:

Play-doh

LITERATURE:

Poem: "Think"

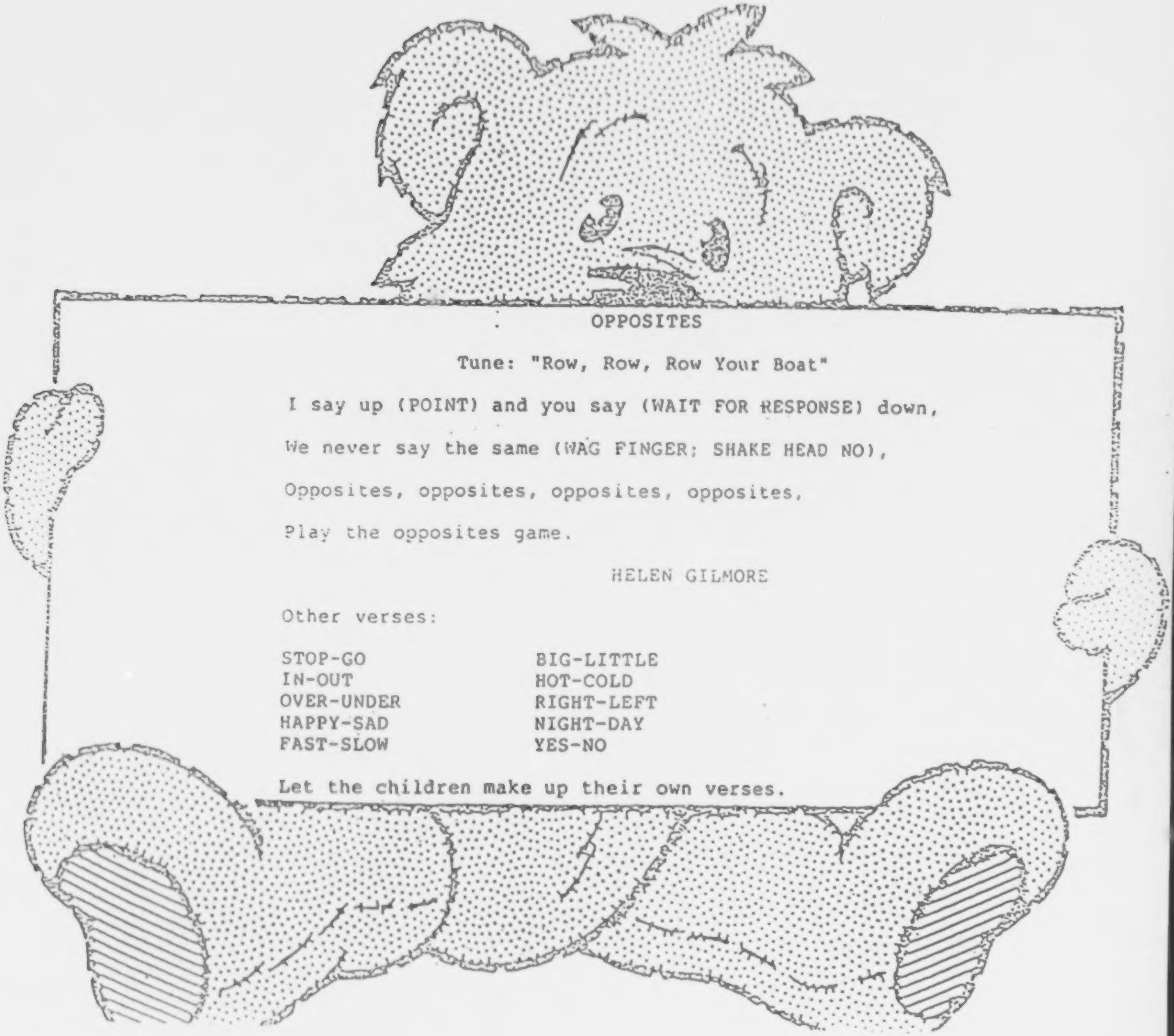
DRAMA/GAMES:

"Opposites"

"What's in a Square"

"What If"

Playing reindeer and other animals



OPPOSITES

Tune: "Row, Row, Row Your Boat"

I say up (POINT) and you say (WAIT FOR RESPONSE) down,
We never say the same (WAG FINGER; SHAKE HEAD NO),
Opposites, opposites, opposites, opposites,
Play the opposites game.

HELEN GILMORE

Other verses:

STOP-GO
IN-OUT
OVER-UNDER
HAPPY-SAD
FAST-SLOW
BIG-LITTLE
HOT-COLD
RIGHT-LEFT
NIGHT-DAY
YES-NO

Let the children make up their own verses.

"THINK, THINK, THINK"

PROVIDE OPPORTUNITIES FOR:

THINKING SKILLS TARGET	COMPARING	FLUENCY
	CLASSIFYING	FLEXIBILITY
	ORDERING Info	ELABORATION
	Doing ANALOGIES	ORIGINALITY

MUNCHKIN MOTIVATOR:

Put at least three packs of large playing cards (for the sight impaired) face down scattered around a large table (child-sized). Let children play with cards and discover differences and similarities. Encourage talking about this as children begin to notice. Have two children at a time (this is difficult) hand you cards who have , eg., a blue back, a pattern like the one being held up, a picture of a man, etc. After many turns and explorations, turn the cards over, face up. "Find all the red valentines . . . the cards the same as your age . . . cards that show how old you'll be NEXT year . . . ones that show how old you were LAST year?"

THINKUMS (ACTIVITIES):

1. COMPARE/ORDER/ELABORATION Begin the session with the poem/game, "Think, Think, Think." Play the "Same Song" game; it teaches similarities. Have actual objects with which to compare the sameness (an apple and orange). If

children come up with any, encourage them. This is an extremely abstract concept for many of them so give them plenty of time to just play with the concept.

2. ORDER Dramatize "The Gingerbread Man." The children will love the sequence of the language in the story. "I ran away from an old woman, an old man, etc.,"

3. ORIGINALITY Make gingerbread men out of brown construction paper (or paper bags). Any shape will do. Let the children attempt to cut them out with safety scissors. Let the children place their men on a real cookie sheet and put them in a pretend classroom oven. Switch the pan for REAL gingerbread men when the children aren't looking. Watch their surprise. Enjoy your snack.

4. ORIGINALITY/FLEXIBILITY Create a design or invention using a "Choose and Do" box of castaway materials (with fasteners of all types). Children love to do this and can't be hurried. Leave plenty of time for children in your class with high elaborative skills that are already highly developed. Have the classification and comparison blocks and past game favorites available.

5. ORDER/FLUENCY

End with "The Frog That Grew" poem. As the children dramatize it, discuss the order of even animals' lives--the cycles of the frog, butterfly, moth, etc. If possible, have a real frog and tadpoles there for them to admire and emulate.

"The Frog That Grew"

First you were an egg, an egg, an egg (ROLL IN BALL ON FLOOR),

Next you were a tadpole, a tadpole, a tadpole (SWIM AROUND ROOM),

Then you grew some legs, some legs, some legs (WAVE ARMS, KICK LEGS)

Now you are a frog, a frog, a frog (LEAPFROG AROUND ROOM MAKING FROG NOISES).

Helen Gilmore

MATERIALS:

Large playing cards, varying patterns on back (3 decks)

"Choose and Do" box

Atribute Blocks

Past thinking games

Cookie pan

Gingerbread men

Brown art paper, scissors

Crayons

Frog

MUSIC:

"Same Song"

ART:

Gingerbread Men

"Choose and Do" Box

LITERATURE:

"Gingerbread Boy"

DRAMA/GAMES:

"Frog That Grew"

PRESCHOOL CRITICAL THINKING SKILLS CURRICULUM

"WHAT COMES NEXT?"

PROVIDE OPPORTUNITIES FOR:

THINKING SKILLS TARGET	COMPARING CLASSIFYING ORDERING Info Doing ANALOGIES	FLUENCY FLEXIBILITY ELABORATION ORIGINALITY

MUNCHKIN MOTIVATOR:

Bring in one flag for each child. Discuss the colors of the flag. Have much talk about red, white, and blue. See which child is wearing red, or white, or blue. March around the room, waving flags, singing this song (TUNE: THREE BLIND MICE):

"WHAT COMES NEXT?"

What comes next? What comes next?
THINK-A-THINK-A-THINK!
THINK-A-THINK-A-THINK!
Red and white, red and white,
Our country's flag, what a sight!
Try to answer with all your might,
Oh, what comes next? (shout BLUE)

Helen Gilmore

THINKUMS (ACTIVITIES):

1. ORDER Lay out simple patterns of attribute blocks on the rug. Check to see if all know the names of the shapes.

"THE SAME SONG"

Tune: "Here We Go Round the Mulberry Bush"

How are an apple and orange the same?
Orange the same, orange the same,
How are an apple and orange the same?
Play the thinking game.

Helen Gilmore

At the beginning, have the actual objects in hand to compare with the child. You may have to give a clue to get the child started.

Other verses:

CAR-TRUCK
TABLE-CHAIR
SOCK-SHOE
SWING-SLIDE
BLOCKS-PUZZLES
FORK-SPOON
CIRCLE-SQUARE
HAMMER-NAILS
CAT-DOG
HAND-FOOT
CEREAL-MILK
EYES-EARS

Let the children make up their own verses.

If any are still hesitant, play "Ring Around the Hexagon (or whatever shape) again. Using all shapes of the same color, lay out a two pattern shape game (the flag game was three pattern). Touching each shape as you go, say, "Square, triangle, square, triangle, what comes next?" (SQUARE). Thump the rug, loudly, where the next shape would be in rhythm to the words, "What comes next?" Sometimes it helps the child understand if his hand is taken to pat, first the shapes, in rhythm and then the spot where the next shape should be. This is the hardest of the thinking skills being used. With sound reinforcement and a strong pulsing beat, this one will be mastered by the students, too.

2. COMPARE/ORDER/ORIGINALITY Ask children if their HANDS can dance? Put on a catchy tape/record, and dance around doing different movements with hands. Then use the poem, "Hands" (ACT IT OUT):

3. ORIGINALITY/FLUENCY/CLASSIFY Put out center material (attribute blocks, Cuisenaire Rods, large playing cards) so it will be possible to work with a few children at a time. Another adult would help with this activity. Have a small pie pan with tiny amount of washable, tempera paint in it on the table. Have many newspapers, paper towels and wet sponges nearby. Help child make handprints on a piece of paper. Adult aide could help clean up each child as handprint is finished. After paint dries, print at top of each page, "------'s (CHILD'S NAME) HANDS". Glue a small

copy of the "Hands" poem to the bottom of page. This makes a nice Valentine's Day (or other special day) gift. Parents are especially appreciative.

4. ORIGINALITY/ORDER/FLEXIBILITY/ELABORATION Give every child a handful of colored, miniature marshmallows, a dozen toothpicks, or so, and a sealable plastic bag, labeled with child's name. While seated at table, demonstrate how designs may be made stringing toothpicks and marshmallows together (eg., geometric shapes, such as square and triangle). Let children work on original designs as pleasant conversation takes place about the interesting figures. Ask child, "Tell me about your design." This is a good time for developing elaborative skills. No comparing, this is strictly a free and open time to fashion whatever child wishes with no value judgements entering the picture. Children may take home finished product (in plastic bag) and any leftover marshmallows (unlikely) or toothpicks to make designs with parents.

5. ORIGINALITY/FLEXIBILITY End with "Hands" poem.

MATERIALS:

Flags

Newspaper, paper towels,
sponges

Pie pan, tempera paint,
colored paper

"Hands" poems, marker

Attribute blocks

Cuisenaire Rods

Playing cards

Labeled plastic bags

Miniature marshmallows

Toothpicks

MUSIC:

"What Comes Next?"

"Hand" dance

ART:

Handprints and marshmallow sculptures

LITERATURE:

Poem - "My Hands"

DRAMA/GAMES:

Dramatize hands song

Flag-waving game

"WHAT COMES NEXT?"

Tune: "Three Blind Mice"

What comes next? What comes next?

THINK-A-THINK-A-THINK! THINK-A-THINK-A-THINK!

Circle, square, circle, square,

Circle, square, circle, square,

Think of the answer and show me where,

Oh, What comes next?

Helen Gilmore

Place two circles and two squares in the order named, horizontally. (They may be cut out of paper or could be Attribute Blocks). Point to each as you sing song. Have several shapes laid out nearby. Invite the child to pick and place the next shape in sequence beside the others.

Other verses:

APPLE-ORANGE	PAPER-PENCIL

Switch to three objects when children understand concept, eg.: Circle, square, triangle. Use paper cutouts or Attribute Blocks.

Let child make up own sequences.

MY HANDS

I use these hands to clap, clap, clap,
They help me give a hug,
I use them to play music
And tumble on the rug.

I use them to play rhythm sticks,
They wave when I dance, too,
They help me whisper secrets,
Like, "Mommy, I love you!"

Helen Gilmore

PRESCHOOL CRITICAL THINKING SKILLS CURRICULUM

"MUNCHKIN METAPHORS"

PROVIDE OPPORTUNITIES FOR:

THINKING SKILLS TARGET	COMPARING CLASSIFYING ORDERING Info Doing ANALOGIES	FLUENCY FLEXIBILITY ELABORATION ORIGINALITY

MUNCHKIN MOTIVATOR:

Tell the story of "Peter Rabbit." Choose actors, giving each child a part, and dramatize story. Discuss how story MIGHT have ended. Encourage any participation.

THINKUMS (ACTIVITIES):

1. ANALOGY Play the game "Analogy." Playing with analogies increases vocabulary and also adds texture to the child's (or adult's) language. This is beginning metaphor which enriches all of our experiences. The relationships discovered by the child will build more lasting understanding of his world. Beginning play with analogical thinking should use items and objects familiar in the child's world. Remember to ease into it by rewording the questions if the child seems not to understand.

2. CLASSIFY Put attribute blocks on the floor. Begin playing with them by placing hoops of wire down and asking, "Can you find any red triangles to go in this hoop?" As the children become accustomed to requests for yellow

triangles, blue hexagons, etc., raise the ante a little, but do it playfully. "I'll bet no one will get the next one. Who can find a BIG yellow triangle to go in my hoop?" Very few will accomplish this, but it is stretching, and for the one or two in the group who can, the light in their eyes is worth it all (be sure children know the terminology for all of the attributes of the blocks).

3. FLEXIBILITY/ORIGINALITY/ELABORATION Vary the activities by altering quiet and active strategies. Play lively music and ask the children to hop around the room as Peter Rabbit might. Or the white cat, "How would she move?" "The mouse with the large pea in her mouth?" "The birds that helped Peter get out of the gooseberry net?" Move to the beat creating original dances of the animals.

4. CLASSIFY/COMPARE Sit quietly on the rug and sing the song, "Classify." Play the game mentioned in the song, "I Spy." You may begin by spying furniture to sit on, a plant that grows (visible tree), and clothing that is red.

5. ORIGINALITY/FLEXIBILITY/ELABORATION The "Choose and Do" box is such a favorite with the children that they would enjoy using it every day. Bring it out and discuss inventions quietly with them. This activity calms children and they seem to become very pensive and self-satisfied. The more ranbunctious will tire of it. Have "old favorite" thinking games available for them.

6. End with dramatizing the poem, "Think, Think, Think."

MATERIALS:

Attribute blocks

Hoops

MUSIC:

Lively, bunny music

ART:

"Choose and Do"

LITERATURE:

"Peter Rabbit"

DRAMA/GAMES:

Favorite thinking games

"Peter Rabbit" drama

"ANALOGY"

TUNE: "TWINKLE, TWINKLE, LITTLE STAR"

SONG:

Play my game, A-nal-o-gy,

I'll begin, you follow me.

SPOKEN:

Bark is to dog as meow is to ---? (CAT)

Feet are to shoes as head is to ---? (HAT)

Hands are to fingers as feet are to ---? (TOES)

Listen is to ears as smell is to ---? (NOSE)

Fish is to swim as bird is to ---? (FLY)

Green is to grass as blue is to (SKY)

SONG:

Now you've played A-nal-o-gy,

Let's keep on, it's fun, you see.

After your child is much more used to analogies, play these more difficult ones. Make up ones of your own; let your child make some up.

SPOKEN:

Paste is to sticky as beach is to ---? (SANDY)

Sour is to lemon as sweet is to ---? (CANDY)

Scissors are to hair as mower is to ---? (GRASS)

Eat is to fork as drink is to ---? (GLASS)

Wrist is to watch as finger is to ---? (RING)

Hands are to clap as voice is to ---? (SING)

Helen Gilmore

"CLASSIFY"

TUNE: "MARY HAD A LITTLE LAMB"

SONG:

Tell me, can you classify?
Classify, classify?
I'll show you so don't be shy,
Then you can classify.

One way is to play "I Spy,"
Play "I Spy," play "I Spy,"
Let's begin, give it a try,
You can classify.

SPOKEN:

I spy something that is an ANIMAL (NEARBY PET OR OUTDOOR ANIMAL THAT IS WITHIN VIEW)

I spy something that is FURNITURE (eg. CHAIR YOU'RE SITTING ON)

I spy a PLACE FOR COOKING (KITCHEN)

I spy a UTENSIL for eating (eg. SPOON)

Helen Gilmore

Make up many new ones; let your child create some. This game may be played at home, or in places where a lot of waiting is required, eg., restaurant or doctor's office.

PRESCHOOL CRITICAL THINKING SKILLS CURRICULUM

"THINK OVAL"

PROVIDE OPPORTUNITIES FOR:

THINKING SKILLS TARGET	COMPARING	FLUENCY
	CLASSIFYING	FLEXIBILITY
	ORDERING Info	ELABORATION
	Doing ANALOGIES	ORIGINALITY

MUNCHKIN MOTIVATOR:

Bring an egg carton in with at least one, raw egg. Ask the children to count the spaces in the carton. "Does anyone know another name for 12?" As the concept dozen emerges, ask what other things come in dozens. "Donuts?" Discuss how each child likes his eggs cooked. Then ask, "What's inside an egg?" Elicit responses. Break and egg into a small plastic cup and talk about who predicted correctly. Ask for the names of all of the parts of an egg.

THINKUMS (ACTIVITIES):

1. ORDER/ELABORATION Talk about what comes from eggs. Chick is the usual reply. Elicit as many responses as possible. The writer has had varied answers from children this age: snakes, alligators, turtles, dinosaurs, frogs, birds, and bugs.

2. FLEXIBILITY/ELABORATION Make up a tune to the old nursery rhyme, "Hickety, Pickety, My Black Hen" and move to

the music.

"HICKETY, PICKETY, MY BLACK HEN"

Hickety, pickety, my black hen,
She lays eggs for gentlemen,
Sometimes nine, and sometimes ten,
Hickety, pickety, my black hen.

3. ORIGINALITY Bring in a sack full of unrelated objects and create a little suspense in the children as to what is in the bag. As an object is taken out, ask first what it is and what it is used for. Then ask, "What OTHER use could you make of this, other than as a comb?" (or paper clip, rubber band, staple remover-- or WHATEVER is in the bag) This game is difficult for the children at first, but if common items are used and much warm acceptance is present, they will venture a "beginner's" guess. The teacher may have to start off by naming a few other ways an item could be used to break the ice and make the children understand more clearly.

3. ALL CRITICAL THINKING SKILLS Begin to review the various concepts using the song games written: "Same Song," "Opposites," "Classify," "What Comes Next?" and "Analogy." Intersperse them throughout this, the last session of the critical thinking skills series. Ask for favorites and honor them first.

4. ALL CREATIVE THINKING SKILLS Dramatize the story of "The Little Red Hen," as it is being told. Try to give everyone a part, even if one has to be invent (someone who

was there in the barnyard). Children will love the "I'll do it myself" part. Make up new endings.

5. COMPARE/ORDER Talk about Humpty Dumpty. Does anyone know what he was? An egg? Compare the words in the rhyme to what happens when an egg is dropped. "Has anyone ever dropped and broken an egg?" "What was it like?" (GUSHY) "Could you have put it back together, again?" "Not even all the king's horses and all the king's men?" Divide the children in two equal groups. Half of them will pretend to be sitting on a wall as Humpty Dumpty was. As they fall to the ground, the king's men (the other half of the class) come to the rescue. Enjoy watching the children try to mend Humpty.

6. ELABORATION/ORIGINALITY/FLEXIBILITY/FLUENCY Before the class begins, draw a large squiggly line on 18x24" pieces of construction paper. Try to make them all the same. Give the children a paper and crayons and ask them to create something from the line. This activity is a little abstract for many children, but some will end up with snakes, railroad tracks, rainbows, etc. The conversation around this activity lends itself well to elaboration. Encourage children to talk about their designs.

7. ORDER End with the poem, "Think, Think, Think." Dramatize its actions. Memorization of poems, stories, and phrases from stories requires a type of sequential thinking skill. It has been the experience of the writer that many children who go on to have difficulty later in school, were

weak in their ability to recognize sequence. This skill of ordering information in the child's world can begin early with playful activities such as this.

MATERIALS:

Egg carton and egg

Plastic cup, napkins

Picture of Humpty Dumpty

Large marked paper

Crayons

MUSIC:

Review of all critical thinking songs

"Hickety, Pickety, My Black Hen"

ART:

Practice with elaboration in art

LITERATURE:

"Little Red Hen"

DRAMA/GAMES:

Review of all thinking games

"Humpty Dumpty"

Appendix D

Critical Thinking Skills Checklist Assessment

STUDENT---- GROUP---- ---PRETEST ---POSTTEST

NOVA UNIVERSITY Ed.D. PROGRAM - PRACTICUM II
CHECKLIST FOR CRITICAL THINKING SKILLS
PRESCHOOL

CRITICAL THINKING

SIMILARITIES / VERBAL

Directions: Given 2 objects that are similar (CAR and TRUCK), identify commonalities ("In what ways are a car and a truck the same?"):

The author identified the following commonalities (Write down anything mentioned by student that is not on list):

---horns

---tires

---take people places

---steering wheels

---lights

---drivers

---seats

---motors

---windows

New items mentioned:

Scoring: Score 1 point for each item. (Range: 0-9) It is suspected the list of 9 items will encompass all items that may be mentioned. If a student comes up with another similarity that is valid, it will increase his score by the number of new, valid items named.

SCORE -----

SIMILARITIES / FIGURAL

Directions: Given a set of shapes (Attribute Blocks) that are similar (SQUARES AND RECTANGLES - 6 each), place the squares in one hoop on the floor ("Look at this pile of shapes; put all of the squares - hold one up - inside of the hoop."):

---0 ---1 ---2 ---3

---4 ---5 ---6

Scoring: Score 1 point for each square correctly placed. (Range: 0-6)

SCORE-----

DIFFERENCES / VERBAL

Directions: Given the initial word of 5 opposite sets of words, complete the sets by naming opposites correctly ("I say up and you say . . . ? We never say the same."):

---up - DOWN

---inside - OUTSIDE

---happy - SAD

---stop - GO

---fast - SLOW

Scoring: Score 1 point for each correct answer. (Range: 0-5)

SCORE-----

DIFFERENCES / FIGURAL

Directions: Given 5 differing sets of geometric shapes (Attribute Blocks) where all but one shape is the same in each set, remove the DIFFERENT shape ("Look at this first set of shapes; take out the one that is different."):

---circle removed from square set

---rectangle removed from square set

---triangle removed from rectangle set

---triangle removed from hexagon set

---rectangle removed from hexagon set

Scoring: Score 1 point for each set correctly executed. (Range: 0-5)

SCORE-----

CLASSIFYING

Directions: (Using Attribute Blocks place a circle in one hoop and a square in another). Given a set of 10 geometric shapes to sort (5 circles and 5 squares), ask child to classify set by placing all circles in the hoop containing the circle and all squares in the hoop containing the squares. ("Look at the pile of shapes; put all of the circles in this hoop that has a circle. Put all of the squares in the hoop that has a square."):

Scoring: Assign 1 point for each shape correctly sorted. (Range 0-10)

---0 ---1 ---2 ---3 ---4 ---5

---6 ---7 ---8 ---9 --10

SCORE-----

SEQUENCING

Directions: (Using Attribute Blocks, place three different patterns on the floor one at a time). Given the three geometric patterns and a varying set of attribute blocks, choose the geometric shape that completes the sequence of the set ("The shapes in front of you are placed in a pattern. Starting here at the left, say the names of the shapes out loud until you get to the end. What comes next? Take a shape from this pile and add whatever comes next to the end of the pattern."):

---circle, square, circle, square (What comes NEXT?) CIRCLE

---square, hexagon, square, hexagon (NEXT?) SQUARE

---triangle, circle, triangle, circle (NEXT?) TRIANGLE

Scoring: Score 1 point for each set correctly completed. (Range: 0-3)

SCORE-----

ANALOGIES

Directions: Given a set of 3 verbal analogies with the last word missing, the child will correctly complete the analogy ("Listen to the words given to you and think a minute; you say the word that fits."):

---Fingers are to hands as toes are to . . . ?(FEET)

---Green is to grass as blue is to . . . ?(SKY)

---Comb is to hair as toothbrush is to . . . ?(TEETH)

Scoring: Score 1 point for each analogy correctly completed. (Range 0-3)

SCORE-----

CREATIVE THINKING

Two aspects of creative thinking have been chosen for a quantitative analysis.

FLUENCY

Directions: Hold up a toothbrush. "Name as many OTHER uses as you can for a toothbrush BESIDES brushing teeth.":

---------------	---------------
---------------	---------------
---------------	---------------
---------------	---------------

Scoring: Score 1 point for each discrete, descriptive item mentioned. (Range: 0-?)

SCORE-----

ELABORATION

Directions: "Tell me all the things you can about your best friend here at school.":

---------------	---------------
---------------	---------------
---------------	---------------
---------------	---------------

Scoring: Score 1 point for every discrete, descriptive thing mentioned. (Range: 0-?)

SCORE-----

APPENDIX E

THINKING SKILLS CHECKLIST ANCILLARY LIST

Appendix E

Ancillary Frequency List of Verbal Similarity Words Named by Children in Thinking Assessment

Response	Frequency
Have Wheels	11
Have doors	8
Stop at red lights	4
Move	4
Have radios	4
Go on roads	2
Take you to store	1
Run over you	1
Toy or real	1
Run on a rug	1
Have wires	1
Clocks	1
Lights	1
Air conditioner	1
Same color	1
Hoods	1
Letters on them	1
Use oil	1
Shift gears	1
Can be same width	1
Both big	1

Question: "How are a car and truck the same?"
(Mini car and truck were shown
to children)

Appendix F

Thinkums: A Parent Guide to Preschool Thinking

THINKUMS:

A PARENT GUIDE TO PRESCHOOL THINKING

HELEN M. GILMORE

NOVA UNIVERSITY Ed.D. CANDIDATE

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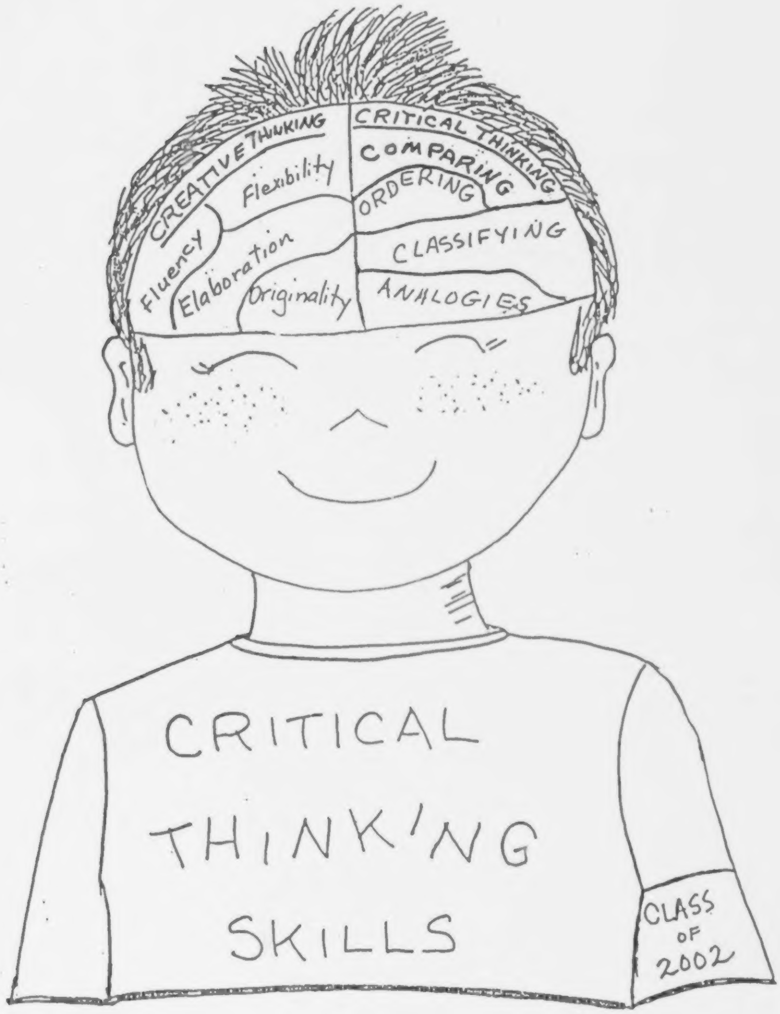
CHAPTER I

LEARNING TO THINK

When asked in a recent Gallup Poll what they hoped their children would gain from their education, many parents commonly answered, "To learn how to think" (Rosenzveig, 1987, p.5). You may already be attempting to raise your child on the latest infant stimulation techniques and good child growth and development practices. The future, though, holds many challenges for your child, what with complicated, high technology already in use and the "Information Age" upon us.

The Class of 2000 is already enrolled in kindergarten. It is none too soon to see that your child is being equipped for this exciting new future. This handbook will guide you into the use of fun-filled, family thinking games and activities in your home with your preschool child.

One South Florida school system, Broward County (Browne, 1987), is already warning that skills in the "three R's" must be accompanied by the "three C's" for the '80s child. The "three C's?" Yes, communicating, critical thinking, and coping. Thinking skills are extremely popular in national education circles currently. Virtually all educational publications have had recent articles about them, some devoting entire issues to the subject. It seems it is dawning on school people that the key to education and the ultimate, final outcome should be the child who can think.


CREATIVE THINKING
Flexibility
Fluency
Elaboration
Originality
CRITICAL THINKING
COMPARING
ORDERING
CLASSIFYING
ANALOGIES
CRITICAL THINKING SKILLS
CLASS OF 2002

THINK, THINK, THINK

I use my brain to think, think, think (TAP TEMPLE)
I use my mouth to talk (SIMULATE TALKING WITH HAND)
I use my eyes to wink, wink, wink (WINK 3 TIMES)
I use my legs to walk (WALK AROUND ROOM).

I use my throat to yell, yell, yell (PRETEND TO YELL)
I use my face to grin (GRIN BROADLY)
I use my nose to smell, smell, smell (BIG SNIFF)
I use my feet to spin (SPIN AROUND ON ONE FOOT).

HELEN GILMORE

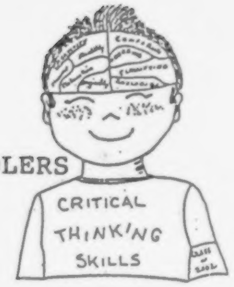
CHAPTER II

CRITICAL THINKING: WHAT IT IS, WHAT IT ISN'T

So, what is critical thinking and how does it relate to your child? The late, Swiss psychologist, Jean Piaget, was the first to investigate how children think and still is the world's leading authority on the subject. Interestingly, he did all of his investigations on his own children. He discovered that the child's capability for thinking, or his intelligence, develops in four stages.

In the first stage, the infant grasps the meaning of the world around him through the way it tastes, feels, smells, looks, sounds, etc., and through getting involved with that world through motor activities (batting at crib toys, etc.). The second, preschool stage finds the child still bound by what is perceived. Thinking is rigid and the child usually focuses on only one small detail at a time in his world. It is hard for this age child to reverse his thinking (Gardner, 1982).

Through many interesting activities, Piaget found that in the third stage, the child begins to understand in his thinking how to conserve ideas (in his mind) involving number, volume, length, shape, etc. By the fourth stage, ages 11 to 12, the child has reached the formal, logical stage, with its new challenges, that can carry through to



CRITICAL AND CREATIVE THINKING FOR PRESCHOOLERS

CREATIVE THINKING

FLUENCY - Develop quantity of ideas or possibilities in short amount of time

FLEXIBILITY - Increase child's ability to change mindset in problem-solving, shift gears and alter ideas and direction of thinking

ELABORATION - Cultivate skill of expanding on an idea, or stretching it by embellishment

ORIGINALITY - Foster child's capacity to create unique and clever responses or solutions to problems

CRITICAL THINKING

ANALOGY - Examine the logic of language and figure-type learning to see relationships; contrasts are extreme -- this is munchkin metaphor

COMPARITIVE Thinking - Distinguish between likenesses and differences in objects and ideas

ORDERING Information - Understand the order, SEQUENCE or pattern in which ideas and events occur well enough to predict the next step

CLASSIFYING - Increase opportunities to categorize ideas and objects in the child's environment; sort the world into interesting patterns and class relationships successful, adult thinking.

Piaget felt that the child builds his own intelligence or ability to think. As the child assimilates new information, it is accomodated in his mind with information already acquired. While interacting with the world around him, the child then regroups his thinking to come up with new ways of viewing things and solving problems. This process is repeated as he matures, all the while learning at his own pace. Play is the avenue to new, more advanced ways of thinking: discovery is the mode.

What does this have to do with the thinking skills in this handbook? What are they and are they really appropriate for your preschool child? Using some of Piaget's theories, the writer has included two categories of thinking skills in this handbook: critical thinking and creative thinking. The writer was convinced, at a Harvard University seminar on thinking skills this past summer, that since the two skills were inseparable, both should be addressed. A noted authority on the education of gifted children (Clark, 1987) says that creativity is the highest form of intelligence, that it takes all areas of the brain to think creatively.

Although there are many ways to think critically, only a few, that have proven to be appropriate for the preschool child will be included (see p.3). CRITICAL THINKING skills will include COMPARITIVE types of thinking. Detecting similarities and differences both in words and objects, such as shapes or figures, are major accomplishments in this area. The more this contrasting takes place, the richer the child's store of information on which to draw.

CLASSIFYING information involves the ability to categorize ideas and objects in the child's world. As your child acquires and refines language ability, the greater the skill of classifying, the greater the mental filing system for later, speedier retrieval in thinking.

ANALOGICAL thinking teaches the child to examine the logic of language and shapes and figure-type learning. In many ways, it is an extension of comparitive thinking. It adds the twist of showing extremes of comparison and how these extremes are related: red is to stop, as green is to ---- (go). ORDERING information by sequence means understanding the order in which ideas or events occur, cracking the pattern or code, and predicting the next step in a sequence.

CREATIVE thinking and problem-solving skills incorporate four major areas. The ability to generate a large number of ideas quickly is called FLUENCY. Quantity is the key with the thought that the larger the number of ideas, the greater the increased chances that several will be usable. FLEXIBILITY in thinking assures the ability to change mindset and direction, to shift gears mentally, and see beyond the obvious.

Being able to expand on ideas and themes in thinking is called ELABORATION. This skill can be used to extend and stretch ideas through embellishment, making them even more workable (Fagan, 1986). The skill necessary to produce unique solutions to problems and clever responses is called ORIGINALITY. Even the business world is after people with this knack.

Throughout the handbook, the writer will frequently urge that critical thinking skills for preschool children are to be learned through play: the way the child learns best. Through play the child experiences the world first-hand and thinks through its many relationships.

Psychologist David Elkind's book, The Hurried Child (1981), carefully describes a situation that is rampant in today's childrearing and schooling practices, that of hurrying the child. This writer feels that critical thinking definitely should not be pushing the child into activities that will stress or harm him.

It is very important that you, the parent, monitor your child in all activities you may attempt (not just in this handbook) and learn to pick up on your child's cues. A child will let it be known, through body language, etc., what he is tuned in to. It should be realized, that teaching isn't telling, it's letting the child build his own knowledge from the inside, through mental activity and interaction with his world. Playful activities and games in small doses for young children will be the best way to carry out the strategies of this handbook. No desks, please, and very little sitting. It should fun; no hurrying, no pushing.

CHAPTER III

ROLE OF THE BRAIN IN THINKING DEVELOPMENT

No one is certain exactly how thinking occurs in the brain, but exciting new brain research is shedding light on this area. Before birth (actually about half way through gestation) the brain's 100-200 billion or so nerve cells are already formed, all the child will ever have or need throughout adulthood (Restak, 1986). Estimates are that less than 5% of the brain's capability is actually even tapped (Clark, 1988).

It is known that each cell consists of branch-like dendrites and that an axon is attached. Educator Barbara Clark (1988) gives an excellent descriptive analogy using the hand as a model of the nerve cell:

> If you open your hand to the fullest extent possible you will have a good representation of the nerve cell. The palm of the hand is the cell body with an indentation at the center that can represent the nucleus of the cell. The extended fingers are located in the appropriate place for the dendrites and would more closely resemble dendrites if branches grew from each finger. The arm extending below the hand makes a good model of the axon that, in fact, extends from the cell body in much the

same way. (pp.25,26)

A glue-like substance, the glia, holds all of the cells together within the brain and acts as a nutrient. The fascinating part is that the stimulation of one or more of the young child's senses (sight, smell, taste, hearing, touch or motion) sets up an interesting reaction.

A sheath-like, conductive insulation, called myelin, forms around the axon. This transmits thoughts more quickly. Dendrites branch even further from the cell which enhances reactions in the brain. In addition, more glia (nutrient) is produced by the brain which causes the whole process to work even more smoothly. The strange thing about the whole process is that no two brain cells ever touch. Electro-chemical energy propels the brain's thoughts and actions. The more myelin, profuse branching of the dendrites, and the nutrient, glia, within the brain, the speedier it works (Restak, 1986).

Many opportunities to have stimulating, exciting, sensory experiences aid the child in laying down the hard wiring needed for even speedier, more efficient thought. No more new brain cells will be generated, but better use is made of the ones already there. Studies have shown that the critical years for making this physical difference in the brain, is between birth and three years of age (White, 1985). The brain doubles in size that first year. However, all is not lost if your child is already three;

the brain continues to be receptive to the stimulation of the senses.

Brain research has shown that if the cells and pathways are not used, the brain sloughs off those not needed and they are lost forever (Restak, 1986). In other words, use it or lose it. Clark (1988) further reminds, "It has been shown that brain processes present at birth will degenerate if the environmental stimulation necessary to activate them is withheld." (p.23)

Another interesting idea growing out of the latest research, is that the mid-brain, or limbic system (the seat of emotion), shuts down or shifts to the lower, less complex area of the brain if fear or great stress is being experienced by the child or adult. Learning and optimum growth cannot take place if the environment is not a safe, supportive, non-threatening one for the child (Languis, Sanders & Tipps, 1980).

CHAPTER IV

WINDOW OF OPPORTUNITY

Other research makes the timing of the playful, enrichment activities in this handbook even more urgent. Dr. Benjamin Bloom, a University of Chicago psychologist, states that by the age of 4, the child has attained 50% of his deviation IQ and by 6 years of age, 80%. If 80% of the deviation IQ is in place by age 6, that makes those first 6 years mighty important and a golden opportunity to assure a good thinking beginning.

Children ARE getting smarter all the time. A little known secret whizzed past educators and parents recently. An internationally known IQ test, the Stanford Binet Intelligence Scale, had to renorm their test because children were scoring higher and higher. They readjusted it down by 10 points. Speculation as to why this change in scores was necessary included: today's parents are more highly educated, children receive (and play with) more educational toys, parents are more mobile, there is better nutrition, and television plays a part (Clark, 1988). A calm and playful enrichment program in the home, using thinking skills activities and games, could lay a broad foundation for success for your child.

CHAPTER V

TECHNIQUES TO FOSTER THINKING SKILLS

The following CRITICAL THINKING SKILL ideas, selectively used in small, relaxed sessions, will mean a world of difference to the mental growth and development of your preschool child. Many of the categories of thinking overlap so some activities are appropriate for more than one skill area.

Since ideas in this handbook are merely suggestions for you, the parent, they will be offered using a strategy common to creative problem-solving techniques. The mode? Open-ended questions. Hints given will answer your assumed question, "In what ways might I teach my preschooler to think?"

The writer has field-tested the ideas in this handbook in several preschools and with many other groups. One woman related a story about one of the thinking skills games. It seems she was trying to get her youngster to show his grandfather how the thinking game, "Opposites," was played. "Come on, let's show him. I say up and you say?" "Down!" "I say fast and you say?" "Slow!" "I say inside, you say?" "Outside!" Suddenly the grandfther started chuckling. He turned to his daughter, shook his

"THE SAME SONG"

Tune: "Here We Go Round the Mulberry Bush"

How are an apple and orange the same?

Orange the same, orange the same,

How are an apple and orange the same?

Play the thinking game.

Helen Gilmore

At the beginning, have the actual objects in hand to compare with the child. You may have to give a clue to get the child started.

Other verses:

CAR-TRUCK
TABLE-CHAIR
SOCK-SHOE
SWING-SLIDE
BLOCKS-PUZZLES
FORK-SPOON
CIRCLE-SQUARE
HAMMER-NAILS
CAT-DOG
HAND-FOOT
CEREAL-MILK
EYES-EARS

Let the children make up their own verses.

head slowly and said, "Your Mother and I play that game all the time."

COMPARITIVE THINKING

SIMILARITIES - In what ways might I help my child think through the ways that things are the same in his world? Play the game, the "Same Song" (see p.12). Use real objects as examples in this simple singing game to find comparisons around them. Stay away from contrasts that are too abstract. Preschoolers aren't ready for them yet.

* Clap out rhythms to make your child aware of patterns and similarities in sound.

* March around the house to music stressing the beat of the music.

* Make rhythm sticks out of dowel sticks (or rulers) so you and your child can gently beat out the rhythm to a song with one stick on the rug and later click the two together.

* Clap out the rhythm to nursery rhymes such as "Mary Had a Little Lamb" so the child will begin to feel the rhythm (and sameness) of language.

* Maracas may be made by placing a few grains of rice or several beans in a yogurt cup and securely taping the lid so it can be shaken to the beat of the music. Use your imagination; other instruments may be fashioned out of inexpensive household material. Help your child listen for

the sameness of the beat.

* Play a family round of a game that matches common sounds using a tape recording of these sounds; it is manufactured in England and distributed by Discovery Toys (see Appendix A). Similar to bingo, four family members can play this fun, preschool game.

* Read, read, read nursery rhymes to your child. The cadence and beat of our language is right there, beginners-style in these age-old, fun poems. Your child will train his ear for language mastery through them.

* Sing with your child; the Wee Sing tapes (see Appendix A) have a good book of nursery rhymes (with tape) set to music. Mother Goose is a definite part of our culture from which even '80s children can benefit.

* Let your child help match sox as you fold laundry. Looking for the sameness of sox seems simple, but is training for later, more complex thinking.

* As you walk through the grocery store, discuss with your child how the same types of products (such as milk) are together in the dairy case - the cheeses together, the butter, etc.

* Make a set of large shapes from cardboard or primary-colored poster board; use squares, circles, rectangles, triangles, and six-sided hexagons. Make a game by mixing everything and then trying to put the shapes that are the same into sets. Commercial kits, called Attribute

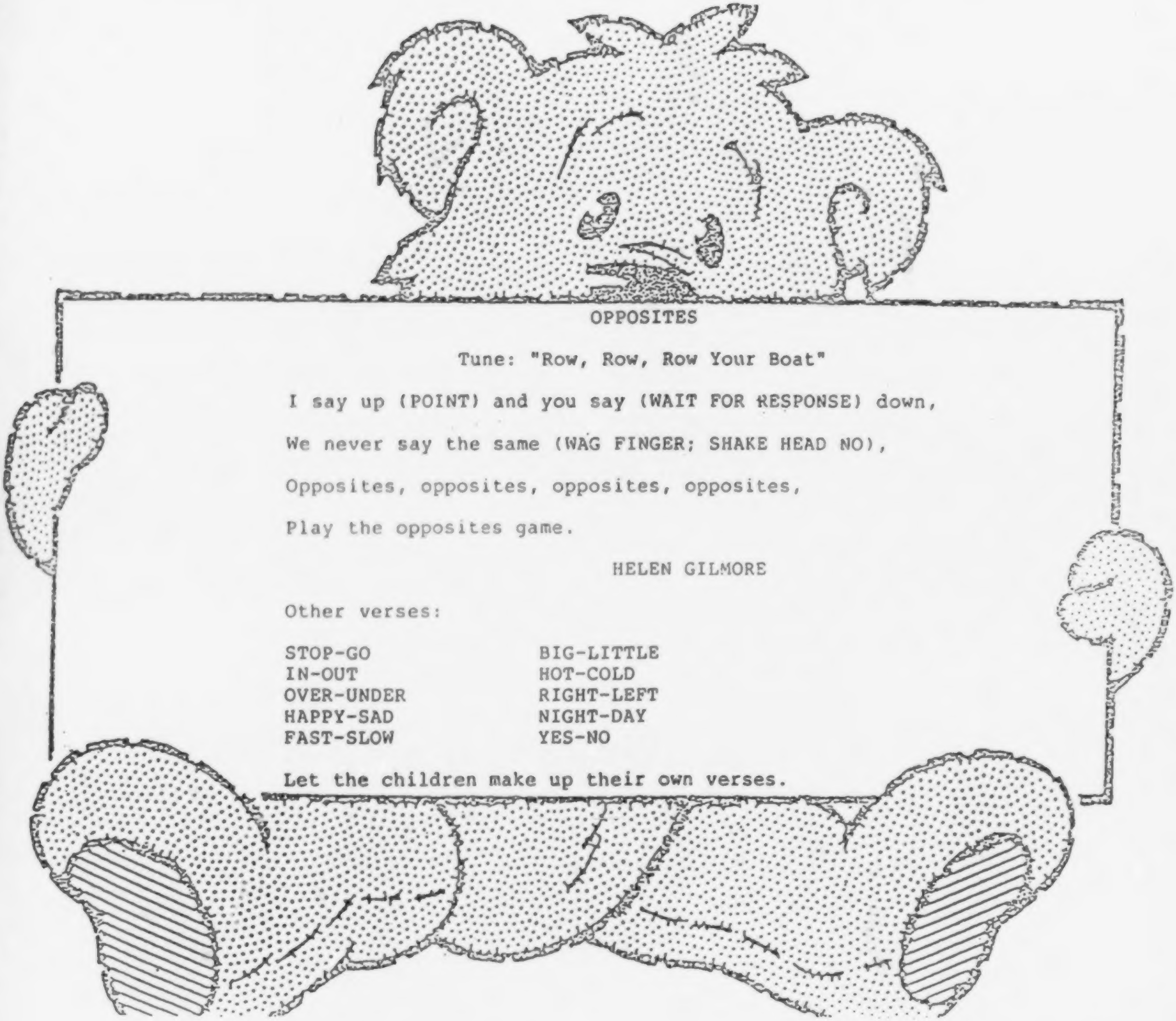
Blocks (see Appendix A), may be purchased; these games are more famously known as those used in British Infant Schools.

* As you set up toy storage space in your child's room, talk about how the similar toys might go together, the stuffed animals all on the bed, or the dolls on the bookcase, etc. This makes it easier for your child to put away things when finished, also.

* Buy several sets of large playing cards (for sight-impaired persons) at the drugstore. Be sure to get different colors and patterns on the back. Spread them around on a table and let your child just play with them first. Later he may be ready to choose cards that are the same - in pattern, colors, number, etc. This also helps with beginning number recognition and pre-reading skills.

* Take backyard nature walks to look for similarities. Almost all birds sing. Ants build hill homes, wasps build strange paper-like homes or nests (use caution, naturally). Some days clouds are ALL puffy and white; on cold days often clouds are ALL wispy and curly-tailed (wonder together about this). Flowers from plants are all the same color. The same fruit always grows on a backyard fruit tree.

* If you have a home computer, use a game such as Reader Rabbit (see Appendix A) which talks to your child; the lower level games can be mastered by preschoolers.



OPPOSITES

Tune: "Row, Row, Row Your Boat"

I say up (POINT) and you say (WAIT FOR RESPONSE) down,

We never say the same (WAG FINGER; SHAKE HEAD NO),

Opposites, opposites, opposites, opposites,

Play the opposites game.

HELEN GILMORE

Other verses:

STOP-GO
IN-OUT
OVER-UNDER
HAPPY-SAD
FAST-SLOW
BIG-LITTLE
HOT-COLD
RIGHT-LEFT
NIGHT-DAY
YES-NO

Let the children make up their own verses.

* Play "Go Fish" with your child. As he groups cards with books of numbers, thinking in similarities will improve.

* An excellent teaching game for preschoolers, "I've Got a Line," (see Appendix A) provides family fun as members match lines and shapes. This game is pre-geometry at its best and lower levels are appropriate for preschoolers. Another game, Imagic (see Appendix A), teaches similarities successfully.

DIFFERENCES - In what ways might I aid my child in seeing how things are different in his world?

* Play the "Opposites Game," as a family (see p. 15). Remember to be concrete with examples, as abstractions are beyond most preschool thinking. As you get into this, play the game at an adult level with your spouse. You'll find it becomes addictive.

* Talk to your child as you choose which produce you will buy in the grocery store, giving your reasoning methods aloud. Let him help you choose the "different," perfect fruits or vegetables as he catches on to your rationale. One famous authority on thinking lets his college students solve problems aloud, in pairs, so that they have the advantage of hearing the usually silent thought patterns. It is then easier to mimic them until individual thought patterns are extablished (Whimbey & Lochhead, 1986).

* As you and your family visit the zoo, discuss how the

"CLASSIFY"

TUNE: "MARY HAD A LITTLE LAMB"

SONG:

Tell me, can you classify?
Classify, classify?
I'll show you so don't be shy,
Then you can classify.

One way is to play "I Spy,"
Play "I Spy," play "I Spy,"
Let's begin, give it a try,
You can classify.

SPOKEN:

I spy something that is an ANIMAL (NEARBY PET OR OUTDOOR ANIMAL THAT IS WITHIN VIEW)

I spy something that is FURNITURE (eg. CHAIR YOU'RE SITTING ON)

I spy a PLACE FOR COOKING (KITCHEN)

I spy a UTENSIL for eating (eg. SPOON)

Helen Gilmore

Make up many new ones; let your child create some. This game may be played at home, or in places where a lot of waiting is required, eg., restaurant or doctor's office.

animals are different from each other, from your household pets, and from you.

* Take a fragrance walk around your house sniffing spices, vanilla, lemons, onions, toothpaste, mouthwash, aftershave and perfume. Discuss how they are different. Our sense of smell is rarely well-developed. This is an expecially good infant-stimulation activity.

* How do different materials in your house feel? After touching the carpet, the refrigerator, the plants, a silk scarf, the nubby weave of a pillow, and a basket, discuss how differently they felt. What are opposite feelings?

* Take a nature walk after a family outing or picnic. Talk about how trees are different. . . leaves, clouds, breezes, the color of various trees and grass, the bark on trees, how various insects and larger animals are sheltered, what they eat, how they are protected in their coloring. How are you and your child different from these animals?

* As you and your family sort and fold clean laundry, what about the differences in sizes of clothing? Can your child find his own clothes due to the size difference?

* One game many children have enjoyed, while waiting to be served in a restaurant, is to quietly, and unobtrusively, make a pattern with the silverware at the place setting and then see if another family member can copy it. Thinking through small differences such as these is training the

child to pick up on the even smaller differences soon needed for close school work and academics.

* Let your child pick from a large group of similar shapes (see Appendix A for the Attribute Blocks mentioned earlier) the one shape that is different from the rest.

* Read, read, read, again, to your child and discuss together the differences in characters, endings (happy, sad) types of books, etc.

* As you stop at a roadside stand, let your child help you view the various flowers and remark on all of the differences.

* As you move through an art museum with your child, let him choose his favorite picture in each room and stand by it. Let him tell you why it is different from all the rest and why it is a favorite.

* Providing puzzles for your child gives much practice in detecting differences. Neighborhood swapping with puzzles (the pieces are so hard to keep together) adds variety in problem-solving.

* Visual thinking skills are improved with a game called Eye Cue Puzzles (see Appendix A). The child should have plenty of time for just playing with the cards before attempting to put any of them together.

CLASSIFICATION - In what ways might I assist my child in developing classification thinking skills?

* Give your child a space of his own in his room, a place to keep special projects, toys, books, blocks, etc. This can then be used to store items in an organized manner and your child can learn classifying skills while helping clean up his room. Discuss that the various types of blocks can all go together, as well as the cars, the dolls, the stuffed toy animals, the books, etc.

* Play What's In A Square. Tel Aviv University has developed some marvelous thinking material for young children including this classification skills game. Motivation to learn is high, especially at the easier levels of play (see Appendix A).

* Walk through large grocery stores or department stores and discuss with your child how everything is classified and grouped. Talk about what some of the advantages might be: faster shopping, easier to compare, etc. As your child becomes accustomed to your favorite grocery store, let him lead you to where you might find ice cream, bananas, or cereal.

* Use the large playing cards mentioned earlier, to classify and sort all the cards that are the same number as your child's age. The child can find all the red valentines, all the cards with flowers on the back and all of the cards that are one number more than his age.

* The Attribute Blocks, mentioned earlier, are invaluable in the teaching of classification. First the child should

be allowed to play with the blocks to his heart's content, several weeks or a month is fine. All the while he can learn the names of the shapes by playing, "Ring Around the Hexagon," or whatever appropriate shape. After a time period, sorting can take place by shape, by size, thickness, or by color. As the child catches on and plays with this, another attribute can be added; put the blue triangles in this circle of yarn. The blocks grow with the child until, as he is older, he can sort and look at all the items on the outside of the circle of yarn and recognize that they are not blue and not round, etc. This is complex logic at work, and all done through play.

* Sort clean laundry by whose clothes they belong to. The child can help classify and fold by family member.

* The child's dresser drawers are an excellent organization system for him to begin to understand. Sox go in one drawer, shorts and shirts in another, and pajamas in another. The child can put away his own clothes, thus reinforcing his understanding of a classification system.

* Play the Sesame Street computer game, Big Bird's Special Delivery. It has a good preschool classification game (see Appendix A). Reader Rabbit, the computer game that talks to your child (mentioned earlier), has an excellent preschool classification game, also.

* Let your child help put canned goods and groceries away so he can discover your organizational system.

* Let your child sort the silverware and put it away in the proper dividers in the silverware drawer after dinner.

* Play the Discovery Toy game, Animal Dominos (see Appendix A). This simple, preschool classification game has beautifully illustrated animals and is fun to play with the whole family.

* Play "I Spy," while waiting in a restaurant or doctor's office to keep your preschooler occupied AND learning. Take turns choosing something to spy. Favorites seem to be classifying by color or by what the object does (function), etc. This quiet, waiting game nicely grows into spying things that start with beginning sounds of the letters of the alphabet as well as ending alphabet sounds for the even older child.

* As your child is acquiring language, classification boosts, by you, will add texture to his language and give him a very broad base from which to use his thinking (Fagan, 1986). As you take your nature walks, before giving him the name of an animal, say, "That's a bird called a cardinal, or that's an insect called an ant." Give him the big category first, thus aiding him in classifying and storing the information for later use. Further ideas? Furniture called a chair, fruit called a banana (Callanan, 1985).

* Show your child how the daily newspaper is classified or organized. The comics page is usually in the same

section daily, the sports page, too; the grocery ads come out on Thursdays.

* Read, read, read to your child. Discuss stories and check to make sure bigger words are understood. Fairy tales and the latest Caldecott and Newbery award winning books are always good. Make friends with the children's librarian at your local library. As your child's interests shift, he or she can help you find certain books. A high interest in recreational reading begins early. Language acquisition will bloom if the child's mind is being stimulated with new fun ideas through books and he is encouraged to think about the books and interact with you or another family member (Fagan, 1986).

ANALOGY

* Play the "Analogy" game (p. 20) and use these analogies often in your discussions. As the ability to pick up on these contrasts grows, the child's language, and his thinking will be more vivid and interesting.

* Make up your own analogies to use with your child or use the Primary Logic book (see Appendix A).

ORDERING INFORMATION, (SEQUENCING) - In what way might I help my child understand the order or sequence in which ideas and events occur?

* Sing and play the "What Comes Next" song with your

"ANALOGY"

TUNE: "TWINKLE, TWINKLE, LITTLE STAR"

SONG:

Play my game, A-nal-o-gy,

I'll begin, you follow me.

SPOKEN:

Bark is to dog as meow is to ---? (CAT)

Feet are to shoes as head is to ---? (HAT)

Hands are to fingers as feet are to ---? (TOES)

Listen is to ears as smell is to ---? (NOSE)

Fish is to swim as bird is to ---? (FLY)

Green is to grass as blue is to (SKY)

SONG:

Now you've played A-nal-o-gy,

Let's keep on, it's fun, you see.

After your child is much more used to analogies, play these more difficult ones. Make up ones of your own; let your child make some up.

SPOKEN:

Paste is to sticky as beach is to ---? (SANDY)

Sour is to lemon as sweet is to ---? (CANDY)

Scissors are to hair as mower is to ---? (GRASS)

Eat is to fork as drink is to ---? (GLASS)

Wrist is to watch as finger is to ---? (RING)

Hands are to clap as voice is to ---? (SING)

Helen Gilmore

child (See p. 22) For some children, this seems to be the most difficult of all of the skills in the handbook. Attribute blocks, used in this game, especially, will bring the concrete meaning needed. As the song says, blocks (or other objects) are lined up in patterns. The child, after playing with the ideas as long as he wishes, tries to predict which comes next in the sequence and places the block in the correct order.

* The "Alphabet Song" and other counting/reciting type songs are a good way to practice this skill. There is not always true meaning in counting at this age. The child will just be mouthing words and can not necessarily regroup in the counting sequence if they get out of order. Other examples are "Old MacDonald," "This Old Man," and sequential nursery rhymes, such as "1, 2, Buckle My Shoe."

* Count with your child and give him plenty of opportunities to count out napkins, silverware, etc. A lot of time with one-to-one matching will help. "Put one paper plate out for each chair at the table."

* Fairy tales, such as "The Gingerbread Man," "The Little Red Hen," and "The Pig Who Would Not Jump Over the Sty" are good stories to read to your child for practice with reciting the sequence of events in the story.

* As you read poems and nursery rhymes to your child, leave out the last word. Give your child the chance to fill it in if he wishes.

"WHAT COMES NEXT?"

Tune: "Three Blind Mice"

What comes next? What comes next?

THINK-A-THINK-A-THINK! THINK-A-THINK-A-THINK!

Circle, square, circle, square,

Circle, square, circle, square,

Think of the answer and show me where,

Oh, What comes next?

Helen Gilmore

Place two circles and two squares in the order named, horizontally. (They may be cut out of paper or could be Attribute Blocks). Point to each as you sing song. Have several shapes laid out nearby. Invite the child to pick and place the next shape in sequence beside the others.

Other verses:

APPLE-ORANGE PAPER-PENCIL

Switch to three objects when children understand concept, eg.: Circle, square, triangle. Use paper cutouts or Attribute Blocks.

Let child make up own sequences.

MY HANDS

I use these hands to clap, clap, clap,
They help me give a hug,
I use them to play music
And tumble on the rug.

I use them to play rhythm sticks,
They wave when I dance, too,
They help me whisper secrets,
Like, "Mommy, I love you!"

Helen Gilmore

* Play Cuisenaire Rods with your child (see Appendix A), using the jumbo, preshool rods. Let your child discover the relationships between these excellent math blocks. Urge him to put them in stairstep order to see if he is ready. Don't push on these difficult tasks. The child's mind and normal perceptions do not always indicate readiness; just let him use them as building toys until he's ready to see the fantastic math that can be taught with them.

* Catch some tadpoles or frogs with your child. The life cycle is a good illustration of how sequence affects the even animals. Try to keep the tadpoles until they turn into frogs and then turn them loose where you found them. Allow for adequate care. You and your child can dramatize the following rhythmic chant:

The Frog That Grew

First you were an egg, an egg, an egg (ROLL IN BALL ON FLOOR),
Next you were a tadpole, a tadpole, a tadpole (SWIM AROUND ROOM),
Then you grew some legs, some legs, some legs (WAVE ARMS, KICK LEGS),
Now you are a frog, a frog, a frog (LEAPFROG AROUND ROOM MAKING FROG NOISES).

Helen Gilmore

* Read Mathematics is More than Counting (Leeb-Lundberg,

1985) to see how much time is needed to develop what is called math-logico concepts. These can't be rushed, but instructive blocks and hands-on materials in the home for the child to interact and play with will help.

* One game that you probably played as a child will assist your child. If he happens to be a dawdler, it will be even better. "The last one dressed is a Rotten Egg." Remember? Concepts such as first, last, second, etc. are readily learned with this game.

* Computer thinking games that are age-appropriate, such as Ernie's Big Splash (see Appendix A) are highly motivating and fun. This one helps in the sequential area.

* Have your child recount a movie or television program that he has seen. Be sure you're not too busy when you undertake this. Having a chance to put into sequence an experience that was savored by your child will be fun for him.

* Let your child practice on simple, step-by-step recipes in the kitchen. Peanut butter and jelly sandwiches are a natural. Following instructions and then being able to eat your work is a great experience. Two interesting cooking books will assist you: Can Piaget Cook? (Christenberry & Stevens, 1984) and A New Way to Use Your Bean: Developing Thinking Skills in Children (Freeman, 1982).

* Following directions with toys also is instructive. Tinker Toys and Legos have sample pictures of things your

child can build. Normally, it's best to just create an original, but in this instance, with no pressure, your child might be able to follow simple instruction sheets. If the pattern is enlarged, Tangrams are excellent practice in seeing the order of these seven pieces of cleverness. They are an ancient teaching tool which is still in vogue (see Appendix A). Parquetry blocks, with their beautiful color patterns to copy, are also ancient tools still in use to teach thinking (see Appendix A).

* Let your child help you make out a grocery list or errand list and then let him help check off each item as you pick them up.

* Get down on the floor with your child and his mini-cars as you play with the Mini-Motor-Mat (see Appendix A). The difficulty with reversing thinking and order, mentioned earlier, gets a boost from this miniature plastic town, with streets, houses, stores and all which is drawn on a large, flat mat. A similar replica of your own town could be drawn on large poster board, or a flattened refrigerator carton, and laminated for durability.

* Let your child tell you a story that you can write down. As ideas are strung together, sequencing skills will get a workout. Grandma and Grandpa would love a copy.

* An interesting visual puzzle, called Eye Cue (See Appendix A) will give practice in sequential problem-solving. Large sewing cards could also be of help.

CREATIVE THINKING - A fresh way of looking at things and solving problems is needed, not only for adults, but for childhood. Creativity can be learned; it is a valuable goal that will enhance your child's entire life.

FLUENCY - In what ways might I increase my child's capability to be more fluent?

* A good listening post with guidance thrown in here and there strengthens this skill. Let your child tell all he can about a flower. Name all the uses for a brick or block. Name all the animals that have four legs, two legs, etc. All the girls names that begin with an "s" sound.

FLEXIBILITY - In what ways might I increase my child's point of view and way of looking at his world to see beyond the obvious?

* Stop when reading a fairy tale to your child and let him make up a new ending. Encourage even silly answers. This stretches the imagination.

* Give your child many opportunities to make decisions about his life to get him used to seeing several ways of resolving a problem. Choosing his own school clothes, his weekly chores, or the site for the next family picnic are good trial runs for flexibility.

ELABORATION - In what ways might I help my child learn to expand on his ideas, to embellish them?

* Let him know it is fine to piggy back on others' ideas. Most creative people do this. One idea sparks many others.

* Try out "Round Robbin" stories with your family. One family member starts the story and stops at a dramatic moment when the next person picks up the plot. This is fun, because the ending is never known until the last person has his turn.

* Help your child trace around his hand and then ask how many things it could be turned into. The most obvious one, of course, is a Thanksgiving turkey.

* Encourage your child to make up a story to go with a drawing. Write the story at the bottom of the page and have him create a title. Save it and read it to him when he wants.

ORIGINALITY - In what ways might I help my child develop his own unique, clever ideas?

* Each of the thinking skills has used the open-ended language, "In what ways might I." Get in the habit of presenting challenges to your child using that language. It generates the most ideas of any way of wording a problem and will encourage your child to chime in with his ways.

* Use this language at family councils (if you have them) to resolve knotty problems you are working on as a family.

* Let your child plan his whole birthday celebration. In what ways might I celebrate? Make invitations? Plan for games everyone can play?

* Play "What If" with your child. What if . . . lizards could talk? Dragonflies gave rides? The ocean was filled with milk? Tadpoles turned into mice? Spiders liked to boogie?

CHAPTER VI

FAMILY THINKUMS

Just a few more generic hints for fostering critical thinking. Childproof your home. Studies have shown that children grow up more curious when they have their whole house in which to explore (White, 1985). Two-year-olds who had been allowed to explore since birth showed more willingness to solve problems (Caruso, 1985).

Provide generic materials (they can be stored in a "Choose and Do" box) for your child to experiment with, either in art, science, inventing or an area of strong interest. Look at things you might normally throw away, and toss them in this box if you feel your child could make something out of it. Of course you'll need paste, string, tape, glue, etc., to hold inventions and designs together. Budding engineers and artists have to start somewhere.

Provide many stimulating experiences for your child. The Florida Diagnostic Learning and Resourses System, will loan computer programs appropriate for your child. Call the local school board for their number.

Plan community trips to enrich your entire family. The County Council for the Arts and also the Friday supplement to the newspaper will keep you posted on upcoming events of interest to children. The Chamber of Commerce has many materials about the many festivals that are held in the state, many nearby.

Encourage a tendency in your child to see things differently. Defer judgement as he is struggling to express budding ideas. Remember the brain research about the limbic system. Where a family is accepting and open to new ideas, the growing child can express those thoughts and feelings happily.

Follow your child's interests and strengths. You are the best advocate your child will ever have. Stay tuned to discover his strengths and then fan the flames. See that opportunities are provided to explore the rest of the world, but also enhance those special gifts.

Take courses in parenting. Local community schools offer many of these that are aimed at whatever age your child happens to be. Think aloud as a family. They may come carry you away, but your child will have magic opportunities to witness the "invisible become visible" by seeing the way you solve problems and organize your world.

Keep a family calendar (on your refrigerator, where else?) and let your child paste stickers on birthdates and special holidays and family celebrations. Refer to it often and remind your child about special dates coming up.

Subscribe to parent magazines and ones for children (see Appendix A). Attempt attending local parent sessions and seminars. You may remain updated by reading some of the books in the reference section of this paper (time is always the big problem, right?).

Thinking training for children is an idea whose time is past due. As a parent, you want only the best for your child. Relax and trust yourself to do what comes naturally to provide the rich, sensory atmosphere that will help him grow best. It's almost like vitamins. Even if you're a new parent, you probably know much more than you realize you do, so mobilize that information and use it with joy for your child. Studies of children who do well in school, who are thinkers and achievers, show that the support system at home demonstrates positive, affectionate guidance to the child (Schickedanz, Schickedanz, and Forsyth, 1982). So as you work (play) with your child, try to "catch" him doing good, and praise him warmly.

Choose from some of the items mentioned in this handbook for birthdays, holidays, etc. Stock your house as a reference center, not only for your child, but for you. If your youngster sees you looking things up, that is providing a powerful role model that will motivate your child to strive for knowledge. There is something contagious about learning new things.

It is a pity that there is not more support for families in our world. Missouri recently passed the only law of its kind in the world: a mandate to assist the parents of children in the first three, critical years of life. At least no one had to show Missouri that the small window of opportunity for enhancing the lives of their children needed attention.

Mark Twain once said that you should give your child two gifts to assure a bright future: roots and wings. You will earn yours every day as you enrich your child's life with daily thinking enhancement.

"Tomorrow's Child"

The child who is a thinker,
Sees wonder in the world,
To him the earth's a banner,
Yet to be unfurled.

Discovery is his passion,
Intently he explores,
Peers deep into the future,
Flings wide its glistening doors.

Helen Gilmore

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APPENDIX A

PRESCHOOL CRITICAL THINKING RESOURCES

PUBLISHER	RESOURCE
Childcraft Education Corp. 20 Kilmer Road Edison, N.J. 08818	Mini Motor Mat
	Parquetry Blocks
	Parquetry Pattern Cards
Dale Seymour Publications P.O. Box 10888 Palo Alto, CA 94303	I've Got A Line
	Imagic
	Eye Cue
	Perception Blocks
Discovery Toys Pleasant Hill, CA 94523	What's That Sound
	Animal Dominos
	Tangrams (7 Pieces)
Gifted & Talented Pub. 213 Hollydell Drive Sewell, N.J. 08080	Gifted Children Monthly (Parent Magazine)
Natural Wildlife Federation 1412 Sixteenth Street Washington, D.C. 20036	My Big Back Yard (Preschool Magazine)
Tandy Corporation Program) Radio Shack Stores	Reader Rabbit (Computer
	Ernie's Big Splash (Computer)
Program)	Big Bird's Special Delivery (Computer
Thinking Works P.O. Box 468 St Augustine, FL 32085	Jumbo Cuisenaire Rods
	Idea Book For Cuisenaire Rods At The Primary Level
	What's In The Square
	Jumbo Attribute Blocks
	Grouping Circles (for Attribute Blocks)

Beall, P., Nipp, S. (1985). Wee sing: Nursery rhymes and lullabies. Los Angeles, CA: Price/Stern/Sloan.

Beall, P., Nipp, S. (1985). Wee sing: Around the campfire. Los Angeles, CA: Price/Stern/Sloan.

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Beall, P., Nipp, S. (1986). Wee sing: Silly songs. Los Angeles, CA: Price/Stern/Sloan.

Beall, P., Nipp, S. (1986). Wee sing: Children's songs and fingerplays. Los Angeles, CA: Price/Stern/Sloan.

Beall, P., Nipp, S. (1987). Wee sing: America, songs of patriots and pioneers.

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Appendix G

Group Observation Summary Log

DATE-87-88	OBSERVATIONS	
	SKILLS	IMPROVEMENTS
OCTOBER	CLASSIFY	Many children shy at beginning. "All ears" when blocks purposfully dropped," Rushed to help with game.
	COMPARE	When choice given via Thinking Center, several children returned to compare blocks.
	ORIGINALITY	Pensively drew things re "I Like to Think About."
NOVEMBER	ANALOGY	Didn't want to stop lifting rock and feather.
	ORDER	Shouted out predictions re what's inside of apple.
	CLASSIFY	Named favorite fruits of members of family.
	FLUENCY	Quickly named many grocery items they liked to buy.
DECEMBER	ELABORATION	Continued Reindeer Dance longer than expected.

Group Observation Summary Log

DATE-1987-88	OBSERVATIONS	
	SKILLS	IMPROVEMENTS
DECEMBER	COMPARE	Many shouted out answer to "Same Song."
	CLASSIFY	Awaited turn quietly for What's in a Square.
	FLEXIBILITY	Eagerly played "What If."
JANUARY	ORDER	Participated in narrative to "Gingerbread Man" drama.
	COMPARE	Several new children chimed in answer to "Same Song."
	CLASSIFY	Several more gravitated to Attribute Blocks during Thinking Centers.
FEBRUARY	FLUENCY	Many named for "Name all the people you would like to be your valentine."
	ORIGINALITY FLEXIBILITY ELABORATION	Most didn't want to stop Marshmallow Sculpture. More described what they were making.

Group Observation Summary Log

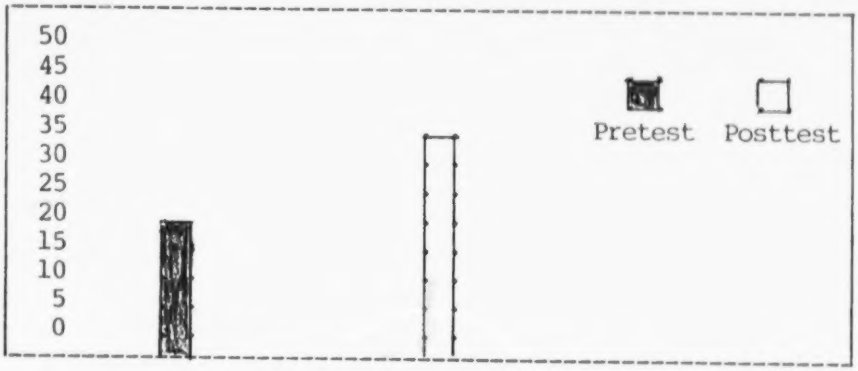
DATE-1987-88	OBSERVATIONS	
	SKILLS	IMPROVEMENTS
FEBRUARY	ORDER	Many shouted out answer, "Blue," to Red, White, and Blue game.
	COMPARE	Frequency and quality of answers improving with "Same Song."
MARCH	ANALOGY	More answers forthcoming. Rhyming ones easiest.
	CLASSIFY	Attribute block placed correctly more often. Many correct answers for "I Spy" game.
	ORIGINALITY	Children cheer when they see "Choose and Do" box. All wanted part in "Peter Rabbit" drama - "I'll be Peter!"
	ORDER	Several now know many of words to "Think" poem.
APRIL	FLUENCY	Long list named from "How many animals come from eggs?"

Group Observation Summary Log

DATE-1987-88	OBSERVATIONS	
	SKILLS	IMPROVEMENTS
APRIL	COMPARE	Didn't want to stop playing "Humpty Dumpty."
		"Same Song" named as favorite game: "How are a cat and a dog the same?"
	ORIGINALITY	Stayed attuned extra long time to sack game: "How might I use this (object) in a new way?"
	ELABORATION	Talked much more during Squiggle Art describing what they were designing. Some verbalize disappointment when it is Thinking Time and their small group does not get to stay for activities that day.

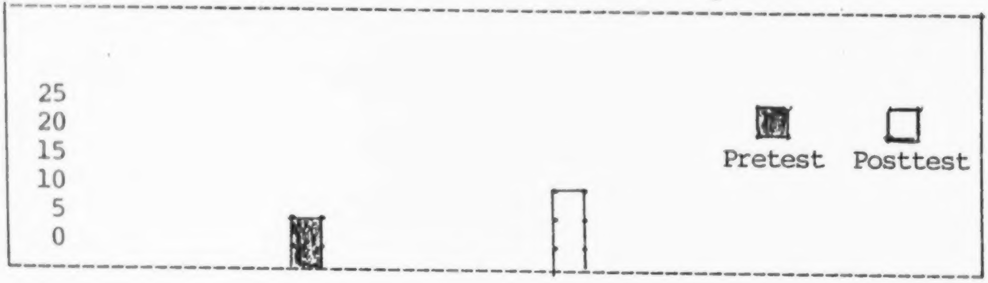
Appendix H

Bar Graph of Change in Critical and Creative Thinking in Global Mean Scores



Positive growth of 14.4 in global mean scores of pretest and posttest critical thinking skills assessment after several month's instruction to preschoolers

Global Mean Scores Creative Thinking

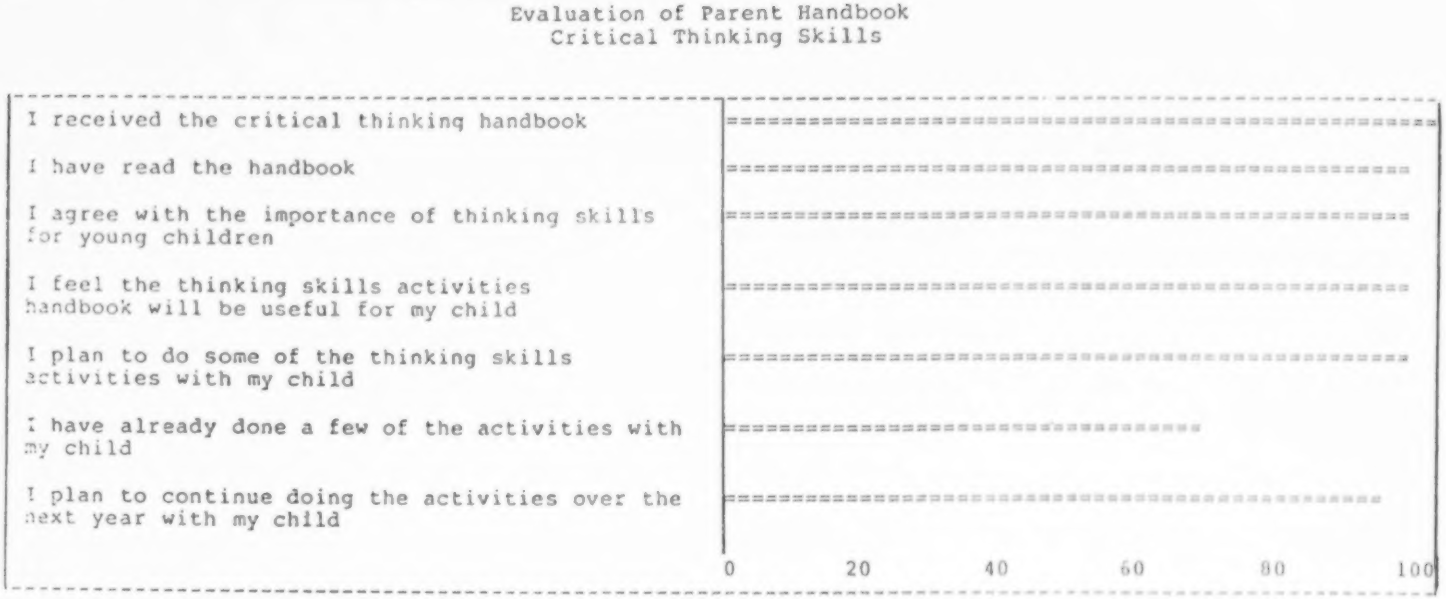


Positive growth of 7.91 in global mean scores of pretest and posttest creative thinking skills assessment after several month's instruction to preschoolers

Appendix I

BAR GRAPH OF PARENT HANDBOOK EVALUATIONS

Figure of Evaluation of Parent Handbook



Graph showing percentage of parents reacting positively to parent thinking skills handbook, May 1988